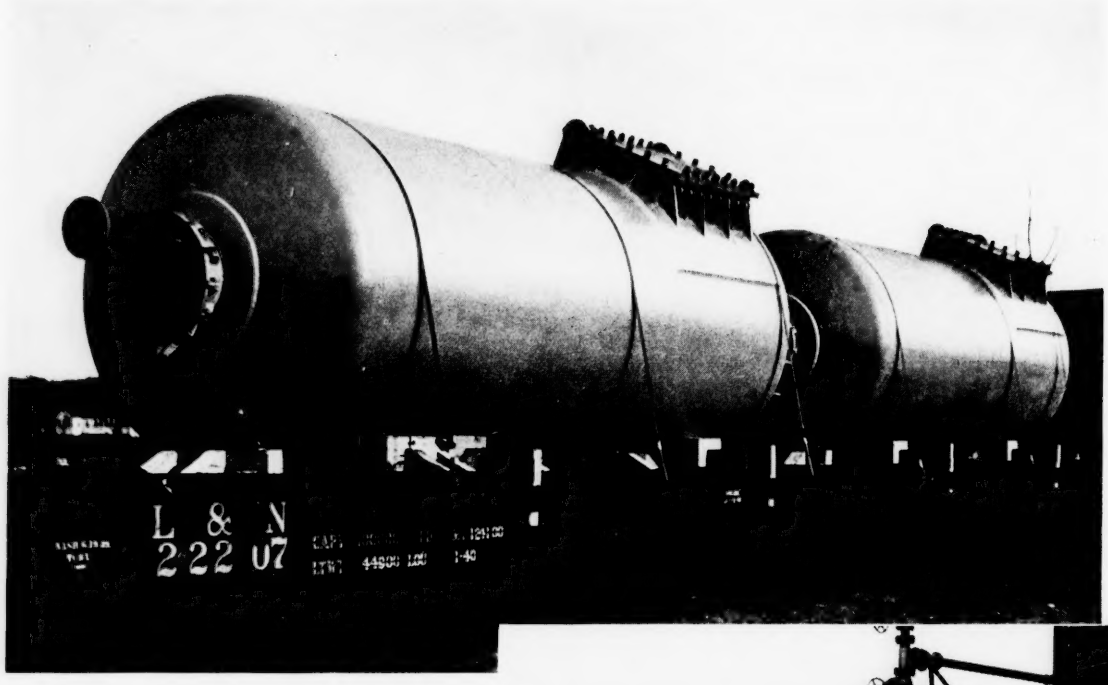
Manufacturers Record

Norfolk, Virginia

This second largest city of the Old Dominion, is a world-famous seaport. With a magnificent harbor and berthing space at its piers for 50 ocean-going vessels, its covered warehouses have 10,000,000 square feet for storage. On railroad tracks of trunk lines running to shipside, room is provided for more than 5,000 freight cars, while belt line railroad facilities provide for efficient interchange of traffic. Norfolk claims the most modern coal piers in the world.

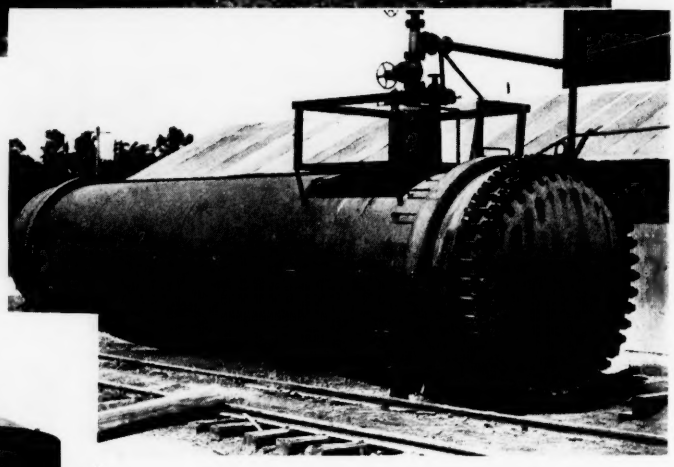
The city has 152 manufacturing plants engaged in the production of textiles, lumber, chemical and allied products, besides packing plants, food processing and others of various kinds.

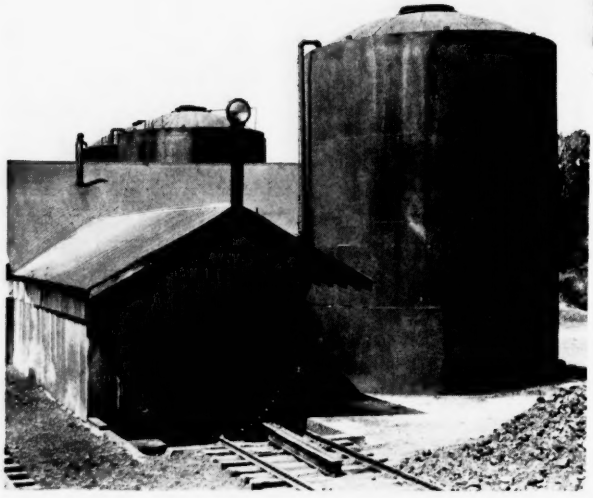
MAY 1940



WELDED TANKS and Pressure Vessels

Fabricated at Birmingham





.....for Southern Industries.

The views on this page illustrate typical welded tanks and vessels which we build at Birmingham for Southern plants of all types. The two 8 ft. diameter by 22 ft. 4½ in. extractors were completed recently for the Crosby Naval Stores, Inc. at Goodyear, Miss. They are of welded construction.

The 8 ft. diameter by 40 ft. retort illustrated above was built for the Crosby Lumber and Manufacturing Company at Crosby, Miss. in 1936, and the three welded tanks at the left erected at the same location two years earlier.

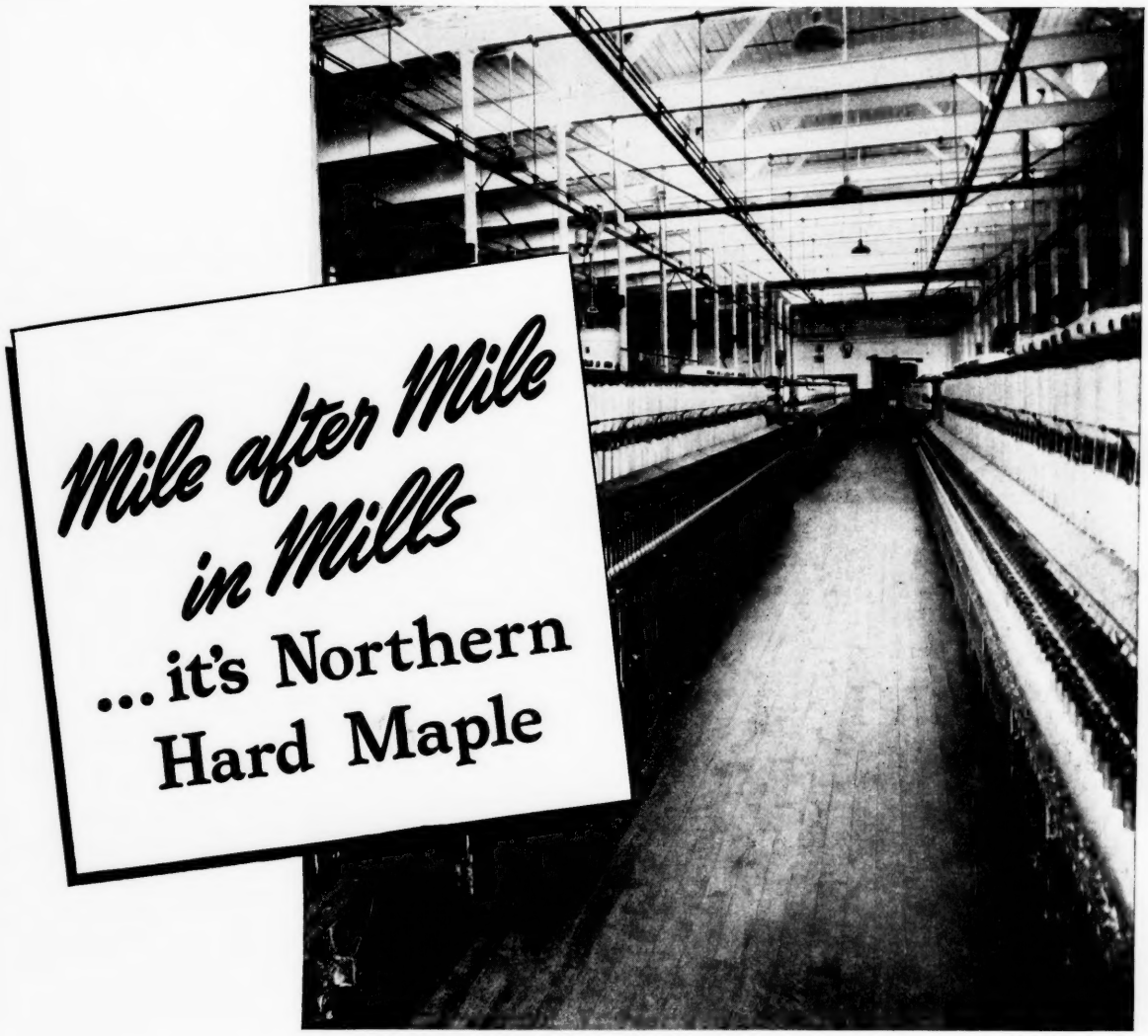
When installing welded tanks or pressure vessels of any kind, write our nearest office for quotations.

CHICAGO BRIDGE & IRON COMPANY

Birmingham	1530 North Fiftieth Street	New York	3313-165 Broadway Bldg.	Philadelphia	1619-1700 Walnut Street Bldg.
Dallas	1408 Liberty Bank Bldg.	Cleveland	2216 Rockefeller Bldg.	Detroit	1510 Lafayette Bldg.
Houston	2919 Main Street	Chicago	2106 Old Colony Bldg.	Boston	1510 Consolidated Gas Bldg.
Tulsa	1611 Hunt Bldg.	San Francisco	1040 Rialto Bldg.	Havana	Edificio Abreu 402

B-723

Plants in BIRMINGHAM, CHICAGO and GREENVILLE, PA.



MFMA *Hard Maple floor in mill of Chiquola Manufacturing Company, Honea Path, S. C.*

You could walk for miles in Southern mills and never step off Maple floors. Some laid at the turn of the century, some almost yesterday—all giving satisfaction every day.

The Chiquola Manufacturing Company, plant illustrated, first laid Northern Hard Maple in 1902. Jas. D. Hammett, Assistant Treasurer, says "We have always considered it to stand up well and give complete satisfaction."

Hard Maple *always* stands up well—and stays smooth, speeds up traffic, is easy on workers, cuts floor costs.

So smooth and hard and tough, it actually "polishes" under traffic, creates no dust, doesn't catch lint—and is warm, dry, resilient and comfortable. It simplifies alterations and machinery shifting—lowers cleaning and maintenance costs, provides lowest cost per year of service.

It will do the same in *your* mill. When you buy trademarked **MFMA** Maple you are sure of all *Northern Hard* Maple, slow-grown in Northern forests. Ask your architect.

MAPLE FLOORING MANUFACTURERS ASSOCIATION
1797 McCormick Building, Chicago, Illinois

• • •

See our catalog data in Sweet's, Sec. 11/78.
Write for leaflet on heavy-duty finishes for old or new floors.

Floor *with* MFMA Maple

REG. U. S. PAT. OFF

(NORTHERN HARD)

TULANE STADIUM

New Orleans, La. Total seating cap. 70,000.
Taken during Texas A. & M.-Tulane game Jan. 1, 1940.

Extensions to Tulane stadium built by Doullutt & Ewin, Inc., Gen. Contrs. Jens Braae-Jensen, Strl. Engineer, using Virginia Bridge steel-deck construction.

The 72,000 spectators who witnessed the Texas Aggies-Tulane game will not soon forget the spectacular performance of big John Kimbrough, the Aggies' great fullback, who by sheer power led his team to a 14-13 victory over the mighty Green Wave.

Neither will they forget Tulane's great stadium—built just right for the greatest comfort and convenience of the spectator. And the owners will remember the economy in both time and money by using Virginia Bridge steel-deck construction for the 45,000 seats added in the 1938 and 1939 extensions —the ease and speed of erection—the advantages of our watertight construction for the double-deck sections, and the many other desirable features obtained in steel-deck construction at minimum cost.

Virginia Bridge steel-deck construction for stadium or grandstand provides maximum seating capacity at minimum cost. Our steel-deck construction is easy to erect, easy to extend, is adaptable to any local requirement, and will last indefinitely if given an occasional coat of paint---the only maintenance required.

Virginia Bridge

STEEL STRUCTURES

VIRGINIA BRIDGE COMPANY

Roanoke Birmingham Memphis

Atlanta New York Dallas

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Cover illustration of Norfolk, Virginia by courtesy of Norfolk Chamber of Commerce.

MANUFACTURERS RECORD

Devoted to the Upbuilding of the Nation Through the Development of the South and Southwest as the Nation's Greatest Material Asset

Published Monthly by the
MANUFACTURERS RECORD PUBLISHING CO.
FRANK GOULD, President

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Member A.B.C.

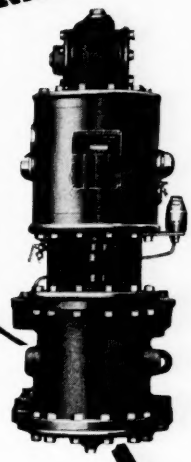
Entered as second class matter at the postoffice, Baltimore, Md., U.S.A., under act of March 3, 1879. Volume 109, Number 5 Monthly

Before You Buy

Investigate!

AIR COMPRESSORS by Westinghouse AIR BRAKE CO.

ONE of the MANY Types



Single Stage Steam Driven

Sturdy locomotive type. Gives long-time service for factory use. Easily installed on post, wall, or stand. For 80 lbs. air and 100 lbs. steam. Sizes 35, 49, and 66 cu. ft. Larger size available, 150 cu. ft., two stage type. » » » » »

Also many types of motor driven compressors up to 200 cu. ft., having exclusive features, and noted for economy, reliability, and durability. »

Write for Literature and Prices

70 Years Experience

Westinghouse . . . .
AIR BRAKE CO.
Industrial Division
PITTSBURGH, PA.

The South's Resources

To be issued by Manufacturers Record *Baltimore, Maryland*

The Opportunity for which America waits

. . . . to develop and expand American industry and to strengthen the economic position of the nation.

. . . . to coordinate industry, employment and to encourage the investment of capital in appropriate industries; to locate plants at the source of raw materials with the correct combination of manufacturing advantages.

. . . . to concentrate the attention of the American people on sound recovery of private industry and profitable production.

The Southern States possess unusual advantages for manufacturing in addition to the necessary resources. They are already contributing largely toward these objectives in new and expanding plants.

"The South's Resources" advertising pages are an excellent medium of contact and an unusual opportunity to offer machinery, equipment and supplies and services to the executives of the industrial plants locating South, as well as the established plants, and to invite new and branch plants to locate. The resource maps and industrial articles on the Southern states give an excellent background and setting.

You can strengthen your position among the thousands of leading executives of American industry who will read "The South's Resources."

Write special delivery, or wire, to reserve advertising space

---

Manufacturers Record

BALTIMORE, MARYLAND

"The South's Business Paper since 1882"

» » » LETTERS « « « AND COMMENTS

"Is it a Crime to Have a Dollar?"

Dr. John J. Wicker,
MANUFACTURERS RECORD:

I have ordered some of your leaflets from the MANUFACTURERS RECORD in Baltimore, Maryland, and one of my friends has also ordered a supply. He is one of the managers of an international business organization. I enclose herewith his comment for your delectation.

F. M. SCHEIBLEY, *Management*,
Strath Haven Inn,
Swarthmore, Pa.

The article referred to, "Is it a Crime to Have a Dollar?" appeared in the August, 1938, issue of the MANUFACTURERS RECORD, *and orders for reprints come in almost daily. They are available at* $1.50 *per hundred.*—ED.

* * *

Editor, MANUFACTURERS RECORD:

Having been a reader of your magazine off and on for a good many years, always enjoyed it, thought perhaps you might be interested in a development now taking place in Okaloosa County, Florida, and which may prove of material benefit to this county in future years—these clippings were taken from the *Pensacola Journal* of Sunday, April 7th, 1940.

I might add that Port Dixie "undeveloped" adjacent to Eglin Field is claimed to be the second largest inland deep water harbor in the United States, if you would desire more information about the size of this harbor and the depth of same. Capt. Mallie Martin of this town can give you full details.

I am merely giving you this information for what you might think it is worth.

M. T. FOUNTAIN,
Fountain Furniture Co.,
Crestview, Fla.

Clippings referred to tell of the growth of Eglin Field, now five years old, into a busy army airdrome. The land was donated to the Government by the late James E. Plew of Valparaiso, and was selected as a site for bombing and gunnery range for air corps tactical organizations after a thorough survey of other areas. Improvements involving the expenditure of $250,000 *have been approved by the House Appropriations Committee.*—ED.

* * *

Editor, MANUFACTURERS RECORD:

The April issue of MANUFACTURERS RECORD has come, and I have looked it over and find an article about a power plant in which part of the equipment was made right here in Minneapolis.

I refer to the article by Mr. Harold G. Burrill, Consulting Engineer, entitled "New Boiler Plant Installed," describing the installation at Hunter Baltimore Rye Distillery at Gwynnbrook, Maryland.

(Continued on page 9)

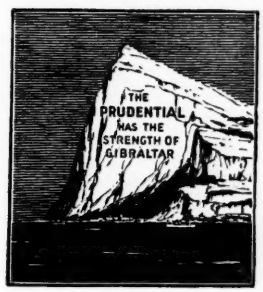
A Wise Precaution

FREQUENTLY a business concern depends for its success upon the knowledge and skill of some key executive. The death of such a man would be a serious loss to the concern.

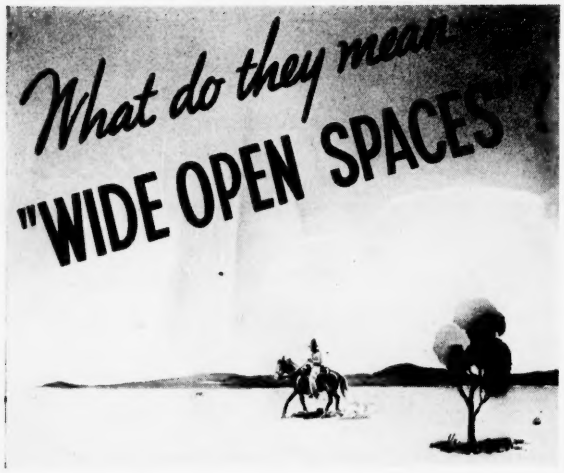
Until he could be replaced there might be a shrinkage in results and profits.

By insuring such an executive with the firm as beneficiary, funds are assured to meet the situation if death occurs. Premiums are paid from the common treasury.

Ask the Prudential Man



The Prudential
Insurance Company of America
Home Office, NEWARK, N. J.



The old family album is up to date alongside this misconception of the great industrial area served by Frisco First. During the past few years alone several thousand manufacturing plants have located in the Friscobelt area.

The processing of raw materials and by-products alone call into action a host of related industries! Vast supplies of coal, gas and oil, and harnessing of water power by hydroelectric dam construction make available more than adequate power and fuel *at low cost* for all possible expansion requirements. Here you have ample skilled and adaptable labor and trouble-free conditions. The efficient Frisco network of transportation means shorter hauls to greater markets—every angle of business consideration emphasizes the importance of the Friscobelt.

Industries depending upon agriculture will find, in the Friscobelt, ideal soil and climatic conditions for the production of needful commodities.

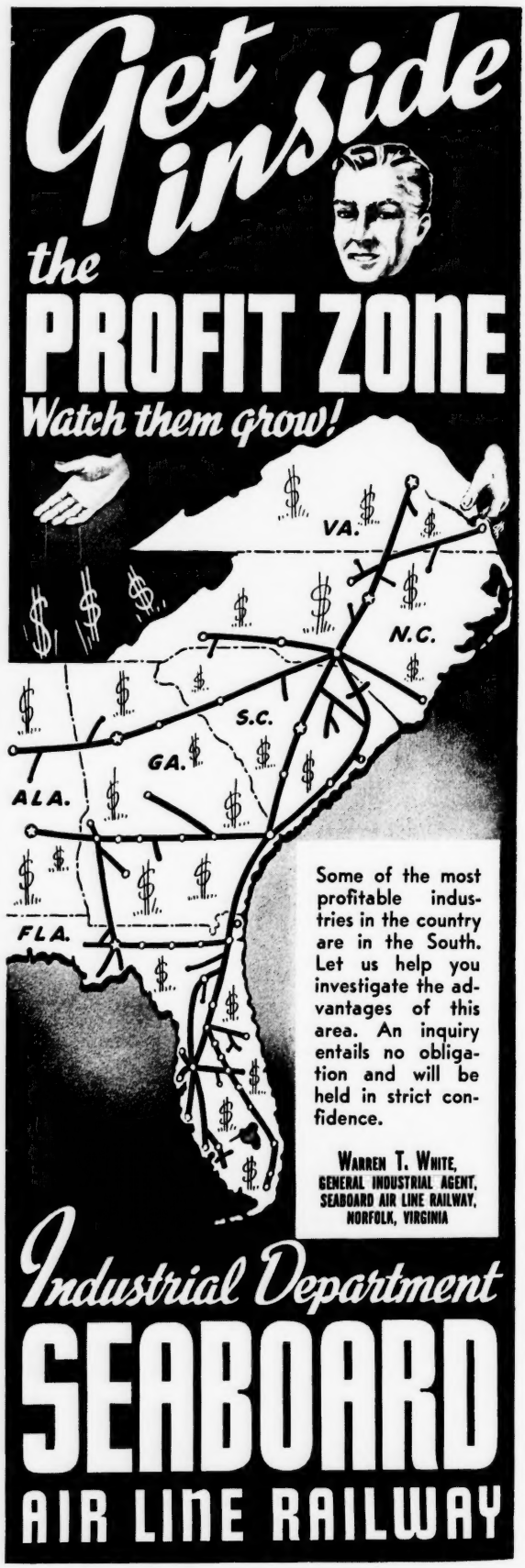
Inquiries will receive prompt, thorough attention.

Industrial Department, Frisco Lines
819 Frisco Bldg., St. Louis, Mo.

The FRISCOBELT

FRISCO LINES
FRISCO FASTER FREIGHT
ST. LOUIS SAN FRANCISCO RY.

★INDUSTRIES FLOURISH in the FRISCO BELT★



"Letters and Comments"

(*Continued from page 7*)

This has some points of similarity with a plant we installed several years ago at a paper mill here in Minnesota, from which plant they selected the new manager for the paper mill at Lufkin, Texas. So you see with Mr. T. A. Wark in Texas, operating the first paper mill using southern yellow pine for pulp, we have another element in common.

After reading the article I have decided that I do not want to miss seeing what other numbers you issue this next 12 months, so have written a check for $2.00 and enclose it herewith, to reinstate my subscription, which probably expires with the April issue just received. If I have another issue coming, make it a year from that date.

M. DWIGHT BELL, *Consulting Engineer*,
Minneapolis, Minn.

* * *

Editor, MANUFACTURERS RECORD:

We have been referred to your publication by Messrs. Leach Bros. Manufacturing Company of Brownwood, Texas.

Our Iran agent sent us a very interesting inquiry for a machine used in the cotton industry and special reference is made to a MacDonald patent.

So far we have been unsuccessful in finding any such machine, obviously of the ginning type, answering to that description, although, of course, Messrs. Leach Bros. have to offer their own very interesting product. The machine consists of a horizontal cylinder, mounted in a wood frame. The cylinder is coupled with an electric motor. The cotton remnants are carried into the rotating cylinder and that rotation first eliminates the dust and, one way or the other, assorts the remnants into what may be called separate drawers.

The Russian Government has made a gift of such a Russian made machine to the Iran Government, but it seems as if the genuine equipment originates from the U. S. A. and it is either an imitation of a MacDonald patent or else a reproduction of same on a license basis.

The Russian machine gave excellent results: 21 different parts were well mixed in one bag of cotton remnants and with the procedure accomplished, those 21 pieces were found each in the respective "drawer."

There is keen interest for such American-made machines in Teheran and I am invited to airmail an offer at the earliest opportunity, plus catalogs, prices, data indicating weights and measurements and the party in question wants to order 20 such machines at once.

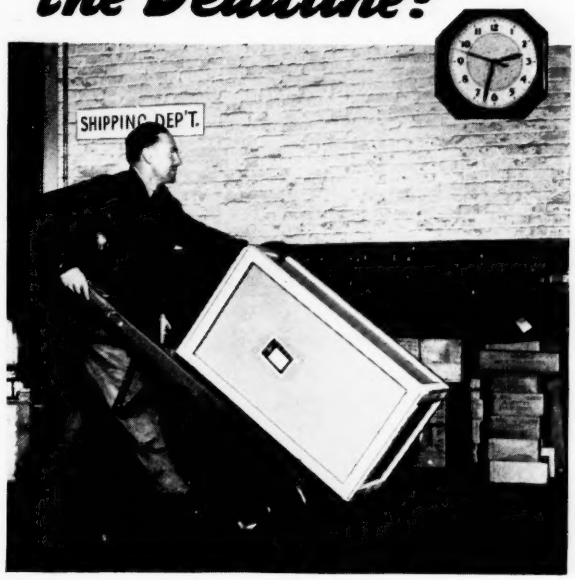
L. G. O. SOBOTKA,
New York, N. Y.

The machine inquired about was patented by Robert E. MacDonald and Gustav J. Scholl on November 28, 1933 and bears the public service patent number 1,937,315.

The purpose of this machine which is manufactured by the Federal Government is to determine the existence of non-existence of the pink bollworm. In the process of ginning, the seed cotton as it comes from the farm is first subjected to a cleaning process and certain waste material taken from it. This machine is used to screen this waste material and subject it to other processes.

Some years ago two men from Russia visited this country, having been sent here by their government to study the cotton business. When they saw this machine they wanted to make use of it in Russia and had somebody in San Antonio build them a few.—ED.

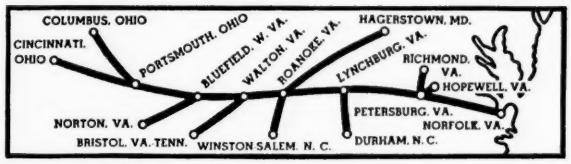
Are You Pushing the Deadline?



SHIP BY RAIL
FOR ON-TIME DELIVERY

With freight to ship and a deadline to make, you won't miss when you ship by rail. Railroads offer time-saving transportation for every type of carload and less-than-carload freight. Between the Midwest and the Virginias and Carolinas and between the North and the South, the Norfolk and Western Railway handles freight shipments with personal care that insures safe transit and on-time deliveries.

Always specify Norfolk and Western routing. You can rely on Precision Transportation to get your shipments to destination in shorter time, with greater economy, reliability and safety.



NORFOLK AND WESTERN RAILWAY

Precision Transportation

(COPR. 1940 N. & W. RY.)

CARBORUNDUM *announces*

2 series of VASTLY IMPROVED RESINOID BONDED WHEELS

WE refer to the improved types of resinoid bonded wheels just developed for foundry grinding practice—the "K" series bonding Aloxite Brand Aluminum Oxide—the "C" series bonding Carborundum Brand Silicon Carbide.

These successful wheels are the products of two fields of investigation and research.

First came the exhaustive field study of industry's requirements—a study made in the light of changed grinding equipment—new and improved methods in the application of abrasives—new grinding conditions resulting from metallurgical progress.

Then these field investigations were correlated with the result of our own research and these new bonds—new types of wheel structures and new processes of wheel fabrication resulted.

These combined facilities have brought to the foundry industry vastly improved resinoid bonded wheels in a range of cutting action to meet every foundry grinding need—from the fastest cutting wheels to the wheels of longest life.

New standards of grinding wheel efficiency have been established to bring about the proper balance between your labor and abrasive costs—to reduce your overall grinding costs.

These new types of wheels are being successfully applied to general foundry grinding, to billet grinding and to miscellaneous work on stand and portable grinders.

You pour it—and we'll grind it.

CARBORUNDUM
ABRASIVE PRODUCTS

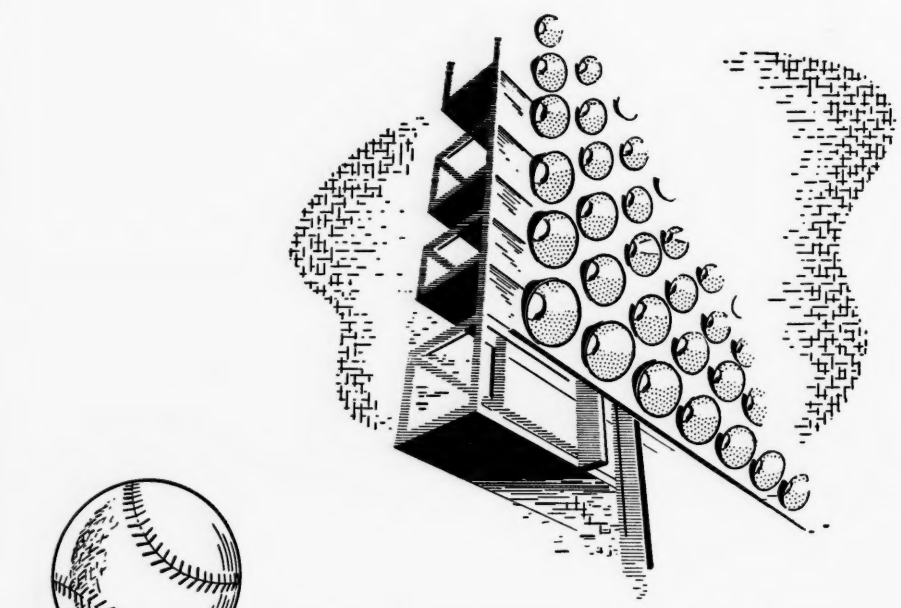
THE CARBORUNDUM COMPANY, NIAGARA FALLS, N. Y.

REG. U. S. PAT. OFF.

Sales Offices and Warehouses in New York, Chicago, Philadelphia, Detroit, Cleveland, Boston, Pittsburgh, Cincinnati, Grand Rapids

(Carborundum and Aloxite are registered trade-marks of and indicate manufacture by The Carborundum Company)

[*Visit The Carborundum Company exhibit at the Foundry Show, Cleveland . . . Booth No. 447*]



ALUMINUM IS A HIT, HIGH OVER THE GRANDSTAND

Night ball is happening to baseball.

But the light that makes night games easy to watch, easy to play, doesn't just happen.

You can't follow the bullet speed of a drive through the box in half-light.

Problem the lighting engineers have solved is to put all the light the players need, where they want it, with minimum shadows and glare.

When you are up against pouring a seeing quantity of light on a spot three hundred feet away, you need a reflector that really reflects.

And you want one that holds this reflectivity under the intense sealed-in heat of the lamp. You don't want it to tarnish. You want it easy to clean.

What they use are Alzak* Aluminum Reflectors, made by leading manufacturers from Aluminum sheet, specially processed to give exceptionally high reflectivity that *lasts*. These reflectors are resistant to the attack of fumes and moisture; the surface is very hard, to resist abrasion. Cleaning is child's play.

Factory managers please note.

The Alzak reflector finish is another Alcoa Aluminum development, which makes the inherent advantages of Aluminum easy and economical to put to work. May we tell you more about it? Aluminum Company of America, 2109 Gulf Building, Pittsburgh, Pennsylvania.

**Registered T.M. of Aluminum Company of America*

Reg U S Pat Off
ALCOA ALUMINUM

ALCOA · ALUMINUM

MORE ROOF FOR YOUR MONEY

WITH *TREATED WOOD*

LOWER FIRST COST

HIGH STRENGTH

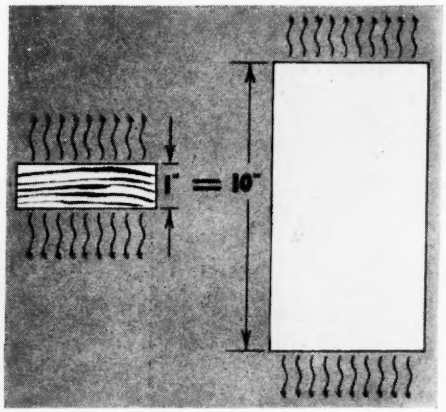
HIGHER INSULATING VALUE

CORROSION RESISTANCE

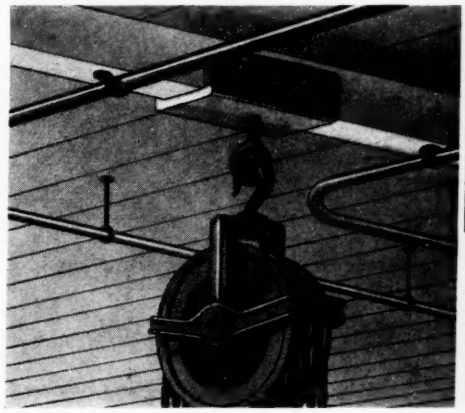
NON-SPALLING

ADAPTABLE

PRESSURE-TREATED wood roof decks generally save about 25% in first cost over other common types of construction material. Long service life keeps annual charges at a minimum.



THE INHERENT insulating properties of wood are very high. Heat loss per inch through southern yellow pine is less than 10% of that through monolithic materials sometimes used.



THE USE OF Treated-wood roof decks simplifies the installation of hangars and permits relocation of supports for piping, shafting, and other equipment, at any time. This flexibility is of definite dollar value.

IN PAPER MILLS like this, as well as in rayon and textile plants, high humidities are encountered. In other process and chemical plants, atmospheres are frequently corrosive. These conditions may cause spalling and disintegration of some construction materials and corrosion of others. Pressure-treated timber is immune to both types of attack. Proper treatment protects against decay and assures long service life—many times that of untreated wood.

OTHER USES FOR PRESSURE-TREATED TIMBER

Piling . . . Wharves . . . Ties . . . Tanks, Sumps, Vats . . . Barges . . . Conduits . . . Cribbing . . . Platforms, Walkways, Flooring . . . Culverts . . . Flumes . . . Poles . . . Trench Lining and Covers . . . Fences . . . Buildings, Bins, Sheds . . . Highway Posts . . . Mine Timbers.

OTHER KOPPERS PRODUCTS

Roofing . . . Waterproofing . . . Bituminous Paints . . . American Hammered Piston Rings . . . Fast's Self-aligning Couplings . . . Platework . . . Castings . . . Tarmac Road Materials . . . Coal . . . Coke . . . Disinfectants.

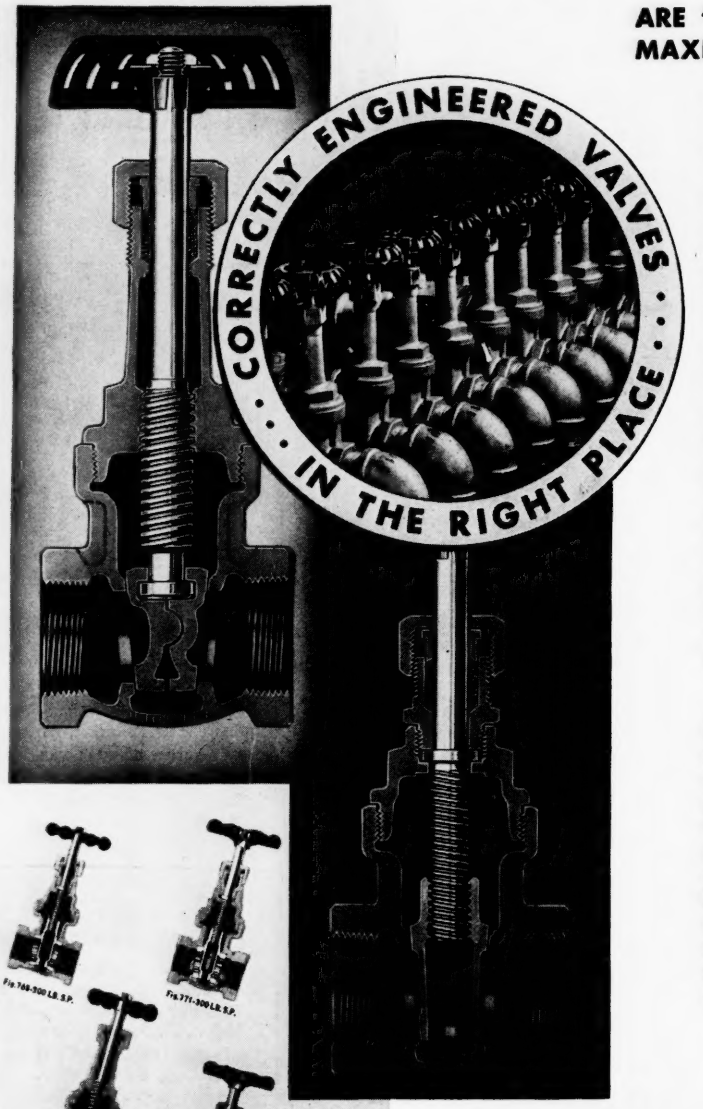
COMPANY

a KOPPERS subsidiary

Designed with extra strength where needed, interchangeable parts, plus other features that save servicing time . . . . . .

LUNKENHEIMER *BRONZE GATE VALVES*

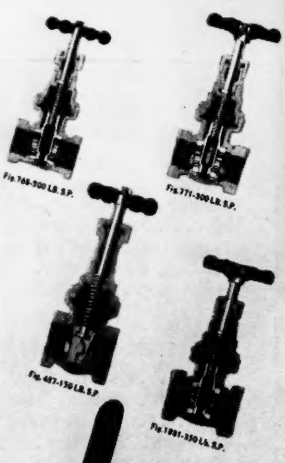
ARE "CORRECTLY ENGINEERED" FOR MAXIMUM ECONOMY ON THE JOB!



From handwheel to pipe threads, there are at least a dozen places to look for convincing evidence that LUNKENHEIMER BRONZE GATE VALVES first, give you more for your valve buying dollar . . . and then save you more on your valve maintenance dollar. Such features as unusually heavy body and bonnet construction, more powerful and accurately machined stem threads, exceptionally sturdy bonnet collar, extra deep stuffing boxes . . . these all combine to guard against failure at points where experience has shown that trouble is most likely to occur. Being an assembled job, with all units produced on a precision basis, any given part can readily be replaced from stock with full assurance of a perfect fit. Even comparatively small details, like beveled disc guides, to facilitate servicing, and the unique stem seat in bonnet, to permit repacking with valve wide open, play a part in the all-over economy of these quality products. You owe it to the profit side of your ledger to investigate the substantially greater value to be found in this line of "correctly engineered" bronze gate valves.

SEEING IS BELIEVING!

Naturally there are basic Lunkenheimer qualities, such as finer materials, continuous metallurgical research, painstaking manufacturing and testing processes, which cannot be seen in the products themselves. We do believe, however, that the purely visible qualities of Lunkenheimer valves will prove conclusively that they are inherently better able to serve you profitably. Won't you, therefore, ask our distributor's salesman, on his next call, to take a Lunkenheimer valve apart and compare it part-for-part with whatever valve you are now using?



ESTABLISHED 1862

THE LUNKENHEIMER CO.

"QUALITY"

CINCINNATI, OHIO. U. S. A.

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Send for copy of our new Catalog No. 78. We will include our handy "Guide", which makes selection easy by grouping valves, boiler mountings, and lubricating devices according to pressures, temperatures, and service applications.

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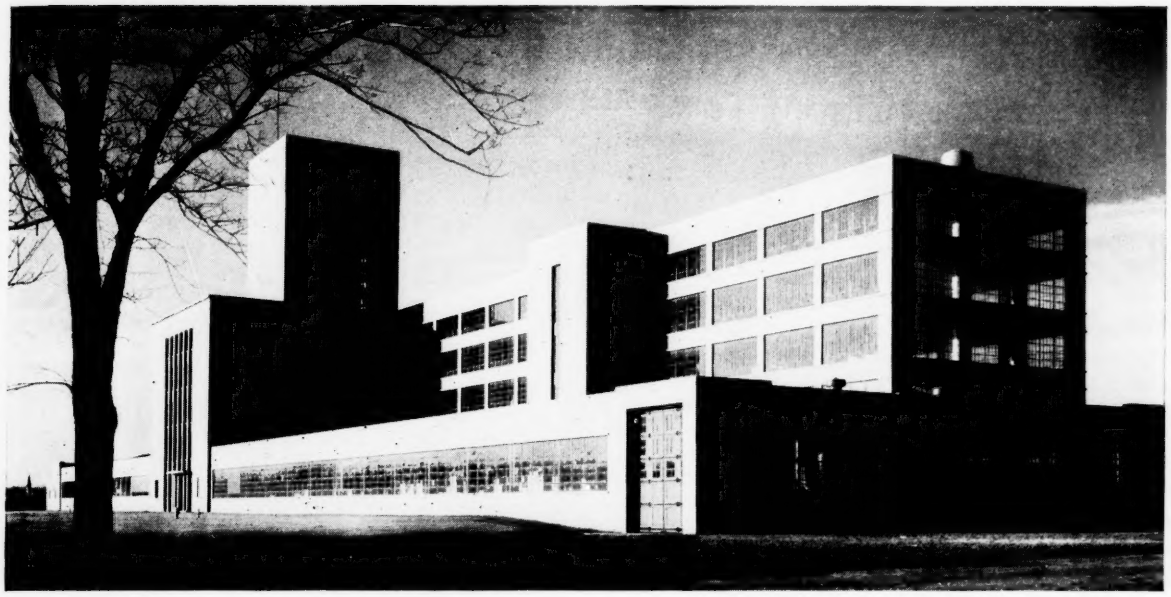


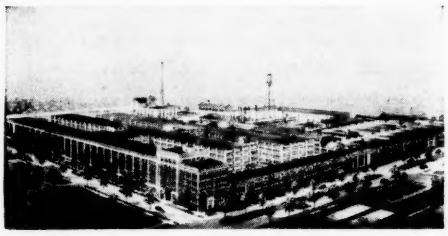
New Burroughs Factory Branch, Plymouth, Michigan

Growth + + +

Over a half-century ago Burroughs started in a small machine shop to manufacture the first practical adding machine. Business has since depended more and more on Burroughs for a steady flow of machines and developments to meet constantly changing conditions. Today's range of Burroughs products includes practically every type of figuring, accounting and forms-writing machine.

With this background of experience and wide variety of machines, Burroughs meets the needs of today's business for speed and economy, and is building for the future along lines which have made Burroughs a worldwide institution.

BURROUGHS ADDING MACHINE COMPANY, DETROIT, MICH.

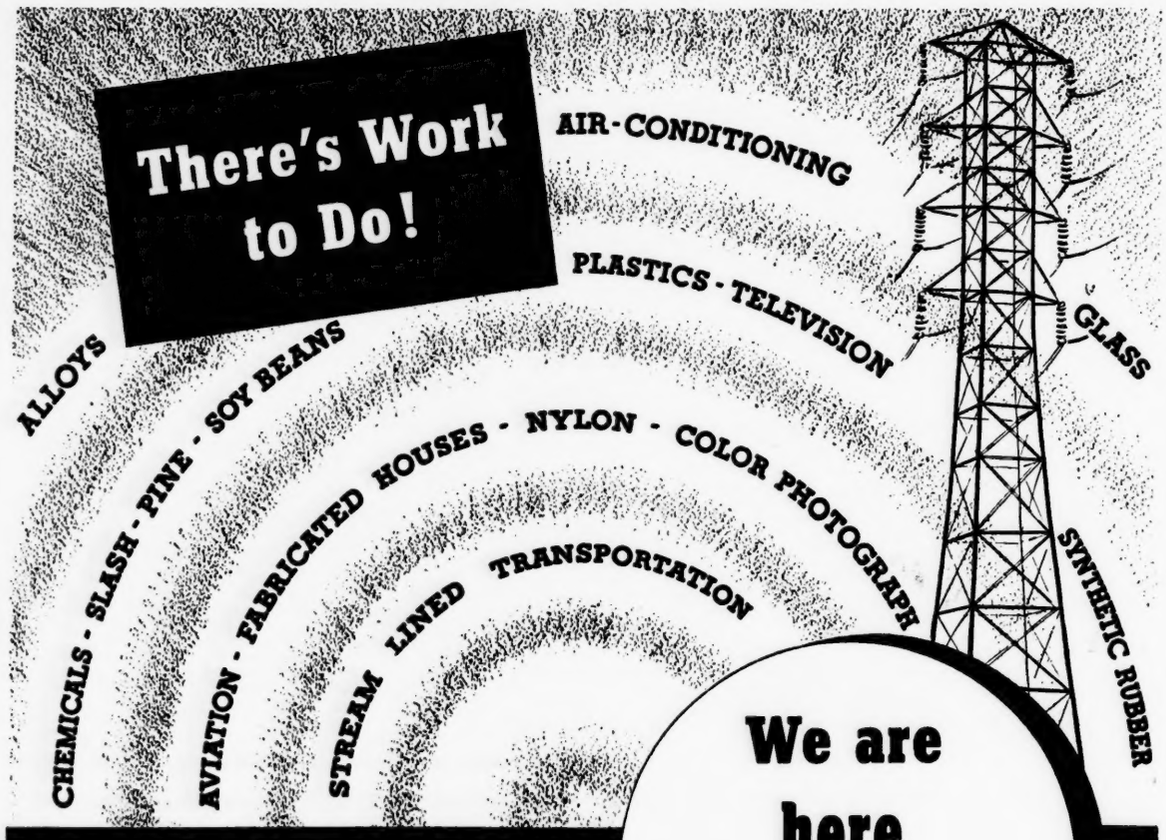


Burroughs Factory and General Offices, Detroit

Throughout the years, Burroughs has adhered to the highest standards of manufacture and quality, and has developed a worldwide factory-trained and factory-controlled service organization.

Burroughs

DOES THE WORK IN LESS TIME—WITH LESS EFFORT—AT LESS COST



THERE'S work to do. Jobs to be had. Jobs to be made. Wages to be paid. There's better living to be created ... more industrial development ... public progress.

The nation is never "done"; human needs are never satisfied; the level of progress is never static.

New products — new materials — new uses —new fields. Reconstruction—obsolescence—replacements—expansion. These are more than "words". Every one stands for elements that mean action, opportunity and national building up ... and back of them, business and industrial enterprise, resource, research and capacity to make them so. It means work and wages.

THE COMPANIES in this system maintain for the benefit of their customers a personnel of experienced power, heating and lighting engineers ... for cooperation in all matters looking to improving customers' operations through use of the companies' services.

Communications and inquiries covering the system territory may be addressed to—Industrial Development Dept., The Commonwealth & Southern Corporation, 20 Pine Street, New York.

We are here to help you

Words? What about the industrial and employment future in such words as these? ... plastics, alloys, slash-pine, "coal-salt-air-and water." Or these words ... air-conditioning, steel and glass houses, aviation, television, chemicals, electricity. New vistas these and new raw material developments on the national horizon.

As a cooperating factor in industrial and employment progress—this company's industrial and engineering facilities are available to industries in matters related to application and use of the system's light, heat and power services in the operating territories.

There's work to be done. Our job is to work with you in present or proposed activities.

The Commonwealth & Southern Corporation

ALABAMA - FLORIDA - GEORGIA - ILLINOIS - INDIANA - MICHIGAN - MISSISSIPPI - OHIO - PENNSYLVANIA - SO. CAROLINA

Cottonseeds aren't served a la carte

But they're on your menu—thanks to chemistry

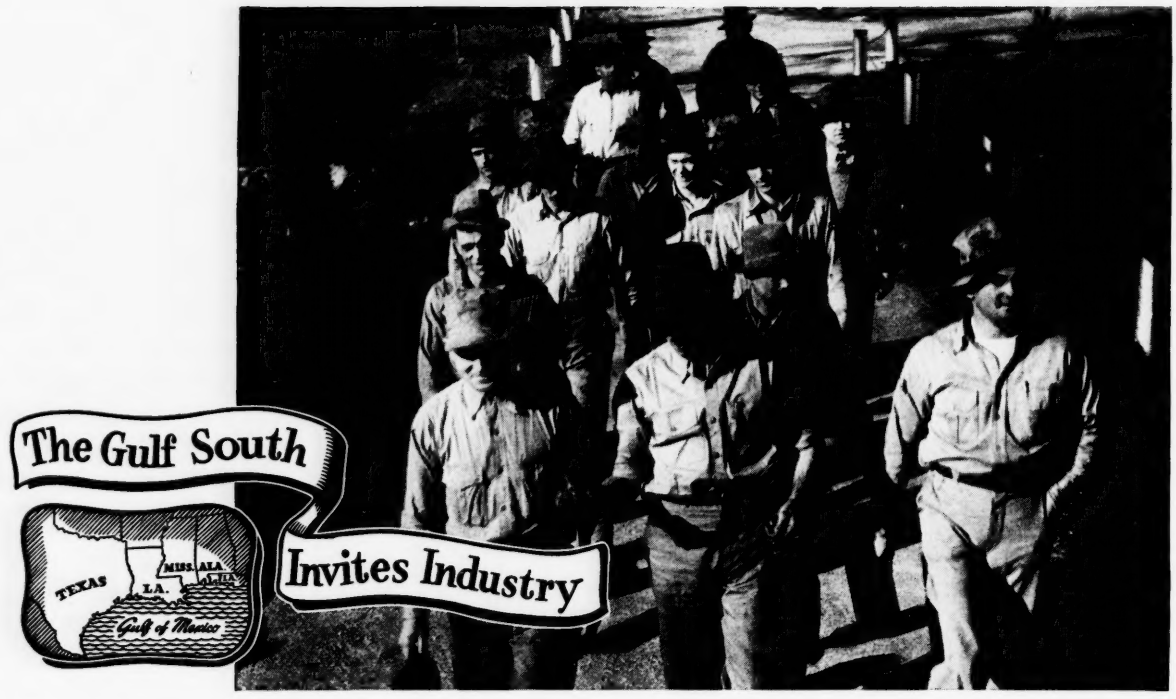
Last year nearly two billion pounds of cottonseed-oil found its way into American salad bowls and industries. The transformation and refining of cottonseed to edible and usable forms is a good index of the volume of Southern chemical industry. Today the South produces more than 700 million dollars worth of chemical products.

Here alkalies are produced in abundance for soap, glass, paper and other manufacturing processes. Chlorine for water purification, textile and paper bleaching. Nitrates for fertilizers and mining explosives. Heavy acids for steel and rayon manufacturing. Petroleum and coal derivatives for synthetic products as well as thousands of other industrial chemicals for use in allied American industries.

Blessed with an abundance of ores, minerals and fertile fields to produce the materials on which this industry is based, the South will continue to expand in this direction.

With a great tidewater steel plant at Sparrows Point, Maryland, Bethlehem stands ready to supply this and other progressive southern industries with virtually every form of steel material essential to modern progress.

BETHLEHEM STEEL COMPANY



Gulf South Labor Can Do a Job for You

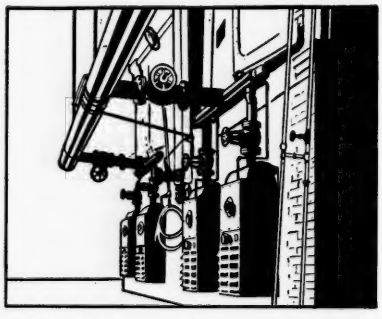
Labor stands ready to do a job for your industry in the Gulf South. Many an incoming Gulf South plant manager testifies to the ready knack of the Southern hand for new methods and processes. There's a reason:

The typical Gulf South workman is native, white, intelligent, with the genius of a long American heritage behind him. He is friendly and co-operative.

Add the stability of American-born labor, both skilled and unskilled, to all the other advantages of industrial location in the Gulf South . . . a network of pipe lines carrying the No. 1 industrial fuel, Natural Gas, direct to a thousand and one plant sites . . . a broad fabric of modern waterways, railways, airways and highways to growing local markets, Pan-American and world trade . . . ample power . . . excellent schools, an equable climate, plentiful land.

Industry is decentralizing southward to a friendlier atmosphere. Move to the Gulf South, where you are wanted and appreciated by your neighbors.

Without obligation, let us make a confidential survey for you to meet the requirements of your industry.



Illustrated here is a Natural Gas-fired steam boiler in operation in the Gulf South. In this region, Natural Gas for steam generation is the customary fuel —economical, efficient, and dependable.

For information on GULF SOUTH opportunities write to
SUPERVISOR OF INDUSTRIAL DEVELOPMENT

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FOR TEXAS, *Mail received at*: Beaumont, Beeville, Dallas, Fort Worth, Houston, Longview, San Antonio and Wichita Falls. **FOR LOUISIANA,** *Mail received at*: Baton Rouge, Lake Charles, Monroe and Shreveport. **FOR MISSISSIPPI, FLORIDA and ALABAMA,** *Mail received at*: Jackson, Mississippi.

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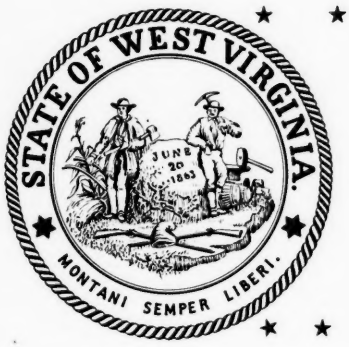

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Unlimited in industrial variety is WEST VIRGINIA! Nearly 3,000 occupational classifications, representing thousands of employees, millions in payrolls, aid in creating hundreds of nationally known products. Ten of WEST VIRGINIA'S diversified manufactories are largest of their kind in the world, many others are pre-eminent in their field. In this remarkably endowed State, industry has available:

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★ UNLIMITED NATURAL RESOURCES

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★ ALL FORMS OF TRANSPORTATION

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★ STABILITY

Industries seeking new manufacturing sites can profitably consider WEST VIRGINIA FIRST!

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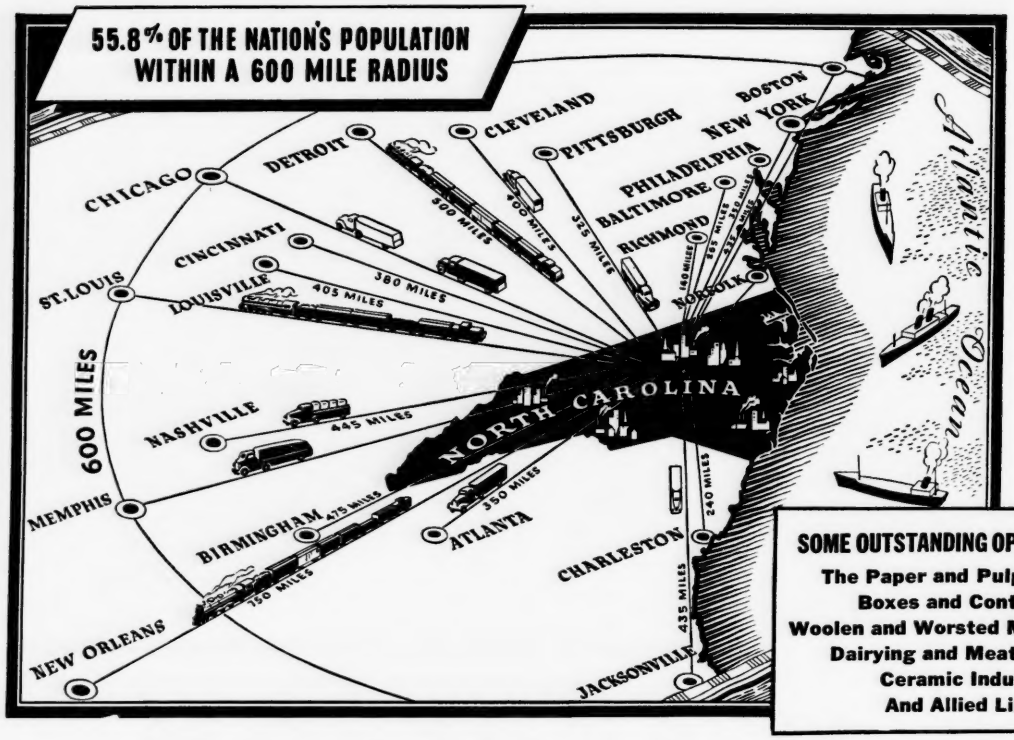

SOME OUTSTANDING OPPORTUNITIES

The Paper and Pulp Industry
Boxes and Containers
Woolen and Worsted Manufactures
Dairying and Meat Packing
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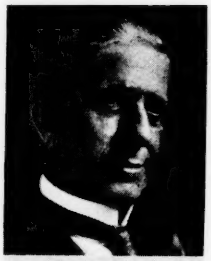
And Allied Lines

ALL THE ADVANTAGES OF SOUTHERN LOCATION

...yet Close to the Largest Markets

OUTSIDE the congested areas...with all the advantages of lower production costs inherent to the South...mild climate, friendly native-born labor, abundant raw materials, plentiful power, excellent transportation facilities, *constructive* and *fair tax structure*... North Carolina *affords, in addition, swift economic transportation to America's largest consuming markets.* Write today for detailed information relating to your business, prepared by competent Industrial Engineers. Address Industrial Division, New State Office Building, Room 2246, Raleigh, N.C.

NORTH CAROLINA



GOVERNOR OF NORTH CAROLINA

GOVERNOR OF LOUISIANA

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"MADE IN THE SOUTH"

CARRIES A POWERFUL APPEAL TO SOUTHERN CONSUMERS

Industry finds ideal manufacturing conditions in the South. Moderate climate, lower living costs, efficient and reasonable labor, a limitless supply of raw materials, splendid power and transportation facilities, plus a rich and rapidly expanding market. Industrial expansion has been so rapid in recent years as to be characterized by noted economists as of "almost explosive proportions."

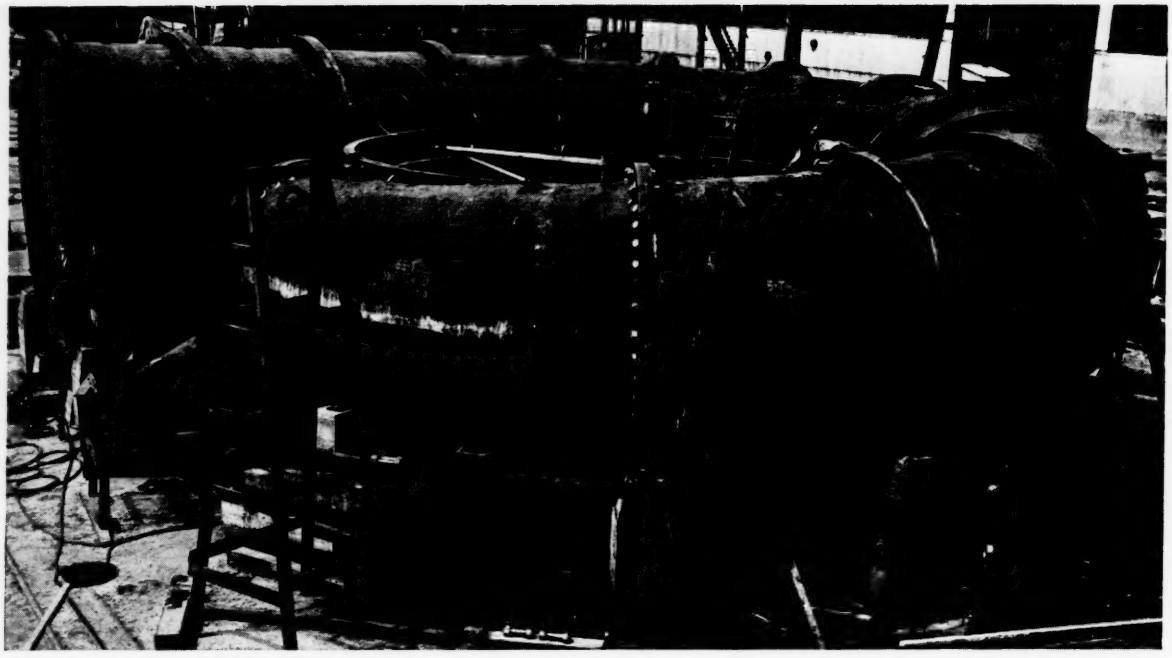
WE, THE GOVERNORS of the Southern States feel it our duty to advise Industry of the growing and natural tendency of Southern people to demand goods "Made in the South."

Today the people of the South stand united upon all issues vital to its economic growth and well being. Preference for "goods made in the South" is only natural and manufacturers who serve the South from branch plants established in this region enjoy a two-fold advantage: lower production costs in the midst of a rich, consuming market that is expanding with amazing rapidity. Make your plans now to "Make it in the South" for southern consumption.

Southern Governors Conference

LAWRENCE WOOD ROBERT, JR., Executive Director • **CARROLL DOWNES,** Industrial Consultant
Bona Allen Building, Atlanta, Georgia

SOUTHERN GOVERNORS CONFERENCE



Cast Steel Scroll Case for one of three 150,000 H.P. Grand Coulee Turbines.

Builders of

HYDRAULIC TURBINES:

Francis

Propeller

(Fixed and Automatically Adjustable Vanes)

• • •

NEWPORT NEWS SHIPBUILDING AND DRY DOCK COMPANY

NEWPORT NEWS, VIRGINIA

SOUTHERN ADVANCE CONTINUOUS

When we compare the development now taking place in the Southern states with conditions of nearly sixty years ago when the MANUFACTURERS RECORD was first published, the widespread benefits of private industrial development stand out with great clearness.

There was a time when articles telling of the South's resources and opportunities were received with doubt. Struggling to overcome the poverty which folowed the Civil War, the Southern states were not regarded then as they have since abundantly proven to be a profitable market for those of other producing areas. Stories of unequalled opportunities for development were not accepted in other sections of the country with the eagerness and approval they are today.

In announcing recently "The South's Resources," an edition of the MANUFACTURERS RECORD to be published soon, the immediate response has been widespread and enthusiatsic. Inquiries about it have come from nearly every state. Investors and industrialists are eager for news of the South. This section is recognized as *the* industrial frontier of the country, presenting opportunities for private industry second to none, and for many lines of effort opportunities found nowhere else.

The South's American population, its climate, wealth of soil and of timber and minerals, present a combination unmatched in other sections. The facts which this issue will present of what the South's resources are and where they are to be found in each of the Southern states are in demand.

As a result of pursuing its chosen work of helping in Southern upbuilding throughout the years of good times and bad, it is more or less natural that this office has become a center for information about the Southern states. Many inquiries are received from day to day bearing upon things that affect Southern progress and the nation's progress. They cover many fields of endeavor. The manufacture of and the outlook for new inventions; the advantage of location in the South for older industries that contend in congested areas with alien workmen and labor troubles; they touch upon Southern education and tax laws; transportation and power. Fortunately, in most cases we are able to supply the information needed.

Such inquiries always are of live interest, because creative, private industry pursuing plans and undertaking work affecting human betterment are compellingly interesting to the thoughtful.

This recognition of the part we have been able to take in the great work of Southern development is gratifying, but beyond that is the recognition, which today extends throughout the country, of the South as an expanding, developing section of the United States rapidly on the way to great accomplishment.

The politics and wars that affect other sections and other countries affect the South too, but in contemplating the industrial empire being built in the Southern states it is well that one's thoughts may be turned from disturbing things that have been so abundant of late, into channels where men's energies will count for future happiness.

A Change Of Policy Needed

War with its destruction is spreading over a large part of the earth. Countries that want to be at peace have no assurance from one day to the next that they will not be embroiled. On the contrary the chances are they will be if their borders touch those of belligerents.

If the world is to be saved to sanity, if the safety and peace of the family and the individual are to be preserved, wild men whose aims make for chaos must be defeated.

Our duty is plain. In examining our own situation in the United States at a time of world-wide emergency, an emergency from which it is impossible for us to wholly escape, common sense dictates that we should get our own affairs in better order than they have been.

We can't escape this war's consequences now or when peace comes, whenever that may be. Readjustments that will affect the lives and welfare of all of us are inevitable.

Government has attempted a lot of foolishness in recent years and while it is essential to give immediate attention to adequate defense measures, it is likewise essential that wasteful extravagance shall stop, unworkable laws be amended or abolished, and none but Americans be allowed in positions of responsibility.

Before Congress adjourns needed changes in the Wagner law and the Wage and Hour law should be made.

The handicaps they impose upon business are all too apparent to have them as they are.

Upon the encouragement of private industry depends future prosperity and employment. The reverse attitude has stopped investment while the attempt has been persistent to control activities of every kind. That we can wait on "reform" until recovery is realized has been abundantly shown. The mischief which has been done has been apparent, while the good, if any, rarely has been observable.

Opportunities in America abound, new frontiers are opening on all sides, an inventive, industrious people have been stopped in their activities because of fear of what may come.

The huge debt created, staring taxpayers in the face while not knowing what their dollar will be worth, has had such an unsettling effect that banks are loaded with unusued money to a degree never before known.

It is time to abandon lines that have been unworkable. We are facing realities; fantastic theories should be laid aside. A full acceptance of the principle that this is a government by the people is essential in order that the United States may present to the world a unified front and purpose. Then we can be of most service to a distraught world.

Guarding speech and action, determined upon peace unless attacked, this country may well thank God for its blessings and its government will do the most good by minding its own affairs while encouraging those who are willing to invest and able to carry out development that is waiting in many of our domestic fields.

A New Textile Fiber

In our April issue there appeared the story of a new textile fiber, Vinyon, produced by the American Viscose Corporation. Because synthetic fibers have been produced for years does not alter the fact that the commercial manufacture of Vinyon is an important chemical and textile accomplishment. From a general textile viewpoint this new fiber's potentialities cannot yet be fully gauged but its value for industrial fabrics is likely to be considerable in view of the producers' claims of unusual resistance to mildew, mineral acids, caustics and alkalis.

At the present time Vinyon is being manufactured at Meadville, Pennsylvania, but since the American Viscose Corporation maintains several rayon plants in the South, as shown in a review of the South's rayon industry published in the March MANUFACTURERS RECORD, it is possible that production of this new fiber will later be extended southward. Such a move would appear logical, for apart from the South being the center of the nation's textile industry, Vinyon is produced from Vinylite, a resin already manufactured in the South. Furthermore, Vinylite is a chemical derivative of coal or natural gas, salt, water, and air—raw materials of which the South has an abundance. Coal is found in 11 southern states and production for the entire region constitutes approximately 50 per cent of the country's total output. Natural gas likewise is a product of 10 states contributing almost half the national production while salt also is commercially produced in 7 southern states. Finally, the water resources of the South are such as to have played an important role in the location of plants manufacturing pulp, paper, rayon, chemicals, etc.

Private Construction Increases

Reports received by Construction Magazine from the South point to encouraging increases in privately financed construction, particularly in the building field, as contracts during April reached a figure that has not been equalled by that month since 1931.

The April figure for all types of construction in the South was $81,960,000—more than thirty-one per cent higher than March and almost thirteen per

cent ahead of April of last year. Private building contracts totaled $19,844,000, of which sixty-nine per cent represented residential building. No month since December of 1938 has touched a level anywhere near this private building total.

Southern total construction contracts for the first four months aggregate $268,774,000, and of these industrial contracts amount to more than twice the total valuation up to this time last year.

Industrial improvements and expansions in the South during the last four months included a wide variety of activities. Expenditures by Southern utilities will run into many millions of dollars. Other millions will be spent by the railroads to meet rising traffic demands.

The expansion work of power companies is indicative of the volume of industrial construction now under way in the South. At the present time new plants or additions costing from $1,000,000 to $8,000,000 are being erected in many of the states below the Mason and Dixon line.

Added to these are telephone and other utility improvements besides contracts for building new plants and additions in the chemical, oil, food products, building materials, steel and other industrial operations.

Employment Increased by Technology

Those who have studied the progress of industry in the United States and examined the figures of per capita employment as the population has grown, know that constant improvement in labor-saving machinery has increased employment instead of the reverse.

It is true that from time to time employment is affected in some instances temporarily while adjustments are made, but in the end other industries develop more demand for labor through the finding of new ways of making things at less cost. The market is spread over a wider area which invariably has increased the call for labor.

At a recent hearing of the Temporary National Economic Committee, which has had a lot of hearings on a variety of topics for some reason, this was brought out by various authorities. Dr. Kreps the economic adviser of the Committee, said: "This can only mean that we are facing not the end of invention (he referred to invention as a cumulative process), but on the contrary an acceleration of the rate of invention. It is entirely probable that we are today on the threshold of a greater period of technological advance than ever before. * * *"

Dr. Kreps testified: "No industry should even pretend to boast that it has made technical progress except as it measures progress in terms of lower prices it quotes to consumers. These savings from increasing productivity, if passed on to consumers, increase the purchasing power of millions of people and give increased opportunities of employment to millions in businesses throughout the country."

Cries go up against the machine at intervals because of the supposed harm it does in lessening demand for hand labor. Taxes are levied on it and further taxes proposed. We might as well try to stop the tides as to attempt to hold up the work of an inventive, virile people constanly searching for ways to make life better.

If the philosophy of those who would stop the invention of new ways of doings things is correct, there has been an awful mistake made in the waste of time and money in educating tens of thousands of American youth to follow scientific careers for greater accomplishment.

America stands out in contrast to the rest of the world because of the inventions in daily use in our homes and our businesses, and the mass production that has made them possible. If we are to stop making improved machinery a long list of necessities would have to be abandoned, for their price would be out of reach of most of us, if made by hand labor.

No Let Up In Spending

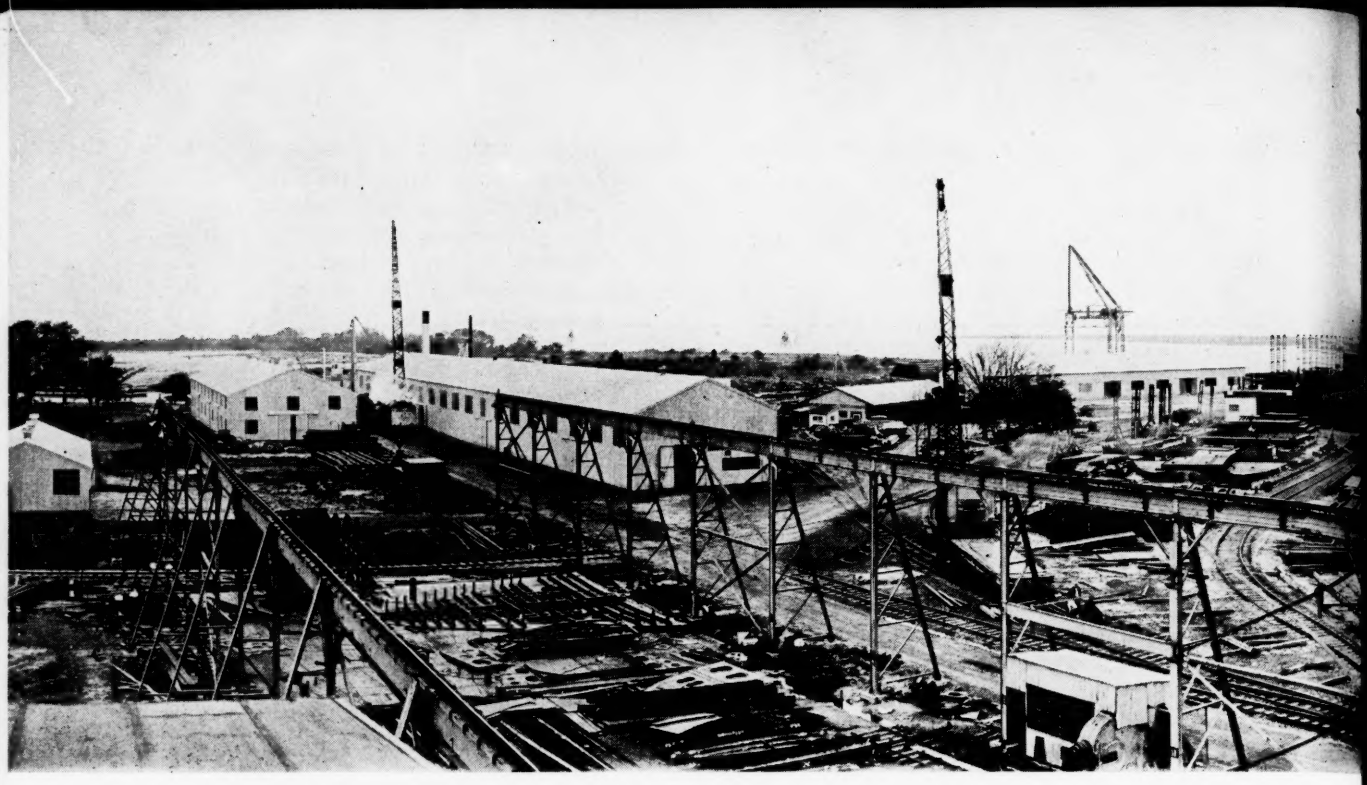
Hope for even an approach to a balanced budget has grown dim. Economy was talked about and attempted by some members of Congress who are alarmed by the way the country's finances are heading us for disaster, but their efforts have been practically unavailing.

Cuts were made in appropriations in one house and put back and increased in the other. This being election year votes must be won, and from present indications previous records of extravagance in spending are likely to be surpassed at this session.

The United States News says $5,000,000,000 will be spent by Federal government in the second half of 1940. "All idea of economy is shattered. The urge to satisfy those home folks who look, directly and indirectly, for a check from the Government overcame the urge in Congress to satisfy those taxpayers who complain about the future tax bill."

Representatives from city districts want more money for WPA and they are backed by mayors who continue their appeals for handouts. Representatives from farm districts are helping along in the spending spree, and thereby gain support for more cash for the farmers.

National defense, a necessity that will take another billion or more, will bring total expenditures by Federal government close to $10,000,000,000 for the year. If business which has been slumping lately doesn't take a big jump as it is expected to by reason of wholesale outlays by government, plus foreign orders, the tax bill that will show up is not a pleasant thing to contemplate.



ALL-WELDED SHIPBUILDING IN MISSISSIPPI

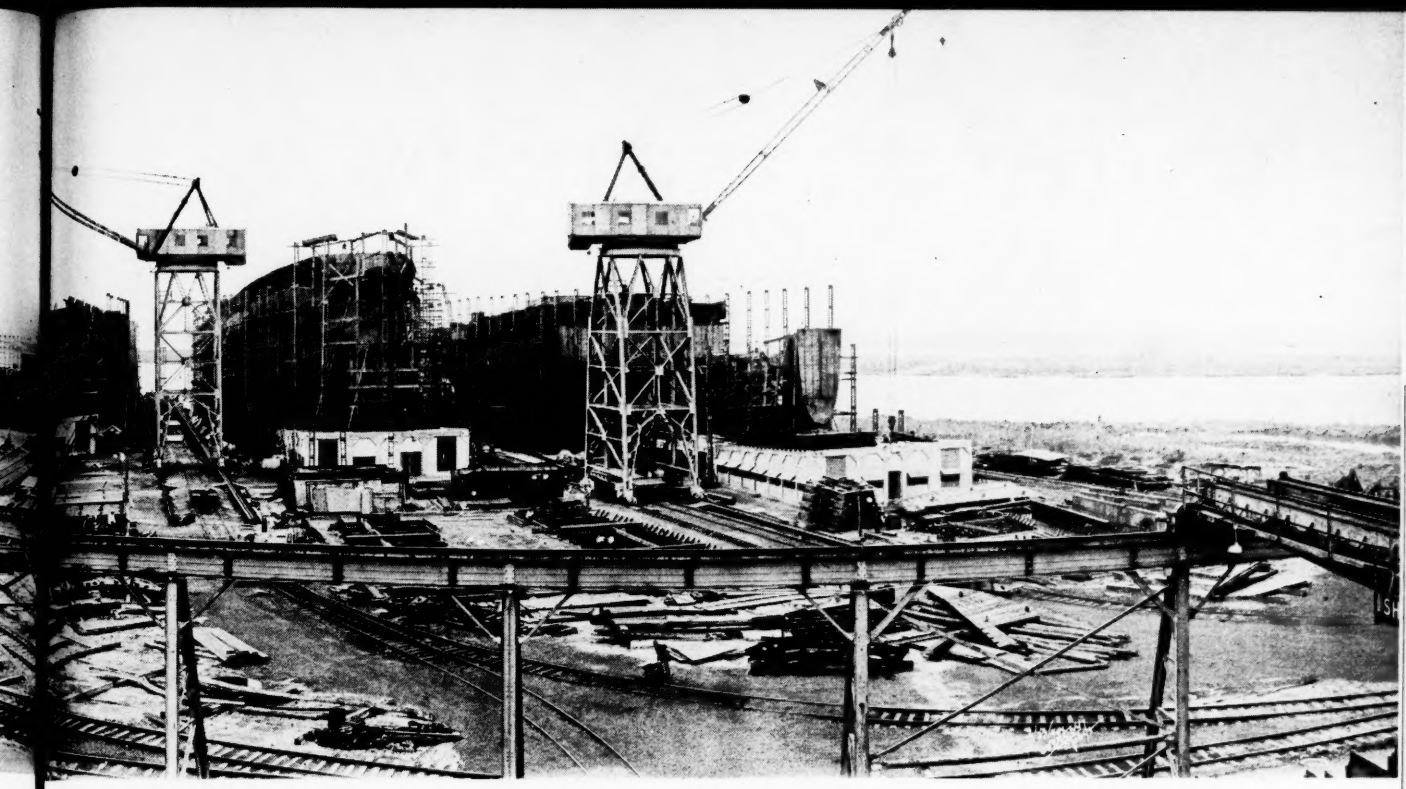
ALTHOUGH shipbuilding is not a new industry in the South the shipyard of the Ingalls Shipbuilding Corporation at Pascagoula, Mississippi, has accomplished several notable achievements and set up more than one record. The corporation is entirely southern, being a wholly owned subsidiary of The Ingalls Iron Works Company of Birmingham, Alabama, headed by Robert I. Ingalls who founded the latter concern in 1910.

In 1938, a tract of land 46 acres in extent with a waterfront of 3,000 feet was acquired at Pascagoula where the estuary of the Pascagoula River enters the Gulf of Mexico, 44 miles west of Mobile and 112 miles east of New Orleans. Here, in January 1939, on a portion of the site specially set aside for such purpose, was located the company's barge building equipment previously situated at the leased Chickasaw yards in Mobile. Welded barge construction got under way immediately and more than twenty hulls were built and launched there early in 1939.

But the new land was acquired primarily for the erection of a plant where large vessels could be constructed exclusively employing the all-welded method. No other shipyard in the country is especially designed, tooled and equipped to build all-welded ships. Also, this is the only shipyard to build such ships "in conjunction with structural fabricating shop located some three hundred and fifty miles away, and working to drawings developed in New York, some twelve hundred miles away" states C. C. Grassick, Manager of the Pascagoula yard, continuing, "according to shipbuilders, this is all wrong and can only result in a great deal of inefficiency. It is, however, being proven that working under conditions outlined above is not only being done successfully, but with a great deal of efficiency and to my mind this shipyard here in the Deep South is well on its way to becoming one of the most successful as well as one of the most permanent in this country."

Ground was not broken for the main buildings until February 20, 1939, yet four 8,900-ton cargo vessels of the C-3 type being built for the Federal Maritime Commission are already sufficiently advanced for the first one to be launched early in June of this year. Immediately thereafter the keel will be laid for the first of four 9,200-ton C-3 type passenger-cargo vessels, the contract for which also was awarded by the Maritime Commission. Concerning this achievement, Mr. Grassick says, "It has been found that to build all welded ships requires that shipbuilding technique and procedure be completely changed from that of the old riveted ship. That this is being successfully accomplished is evidenced by the fact that our ships are being built here with speed equal to that of the riveted ship and will, as time goes on, be accomplished in a considerably shorter space of time than is the case at present."

Eighty-two days after breaking ground the first building was completed and open for operations. This was the mold loft with plate and shape storage and laying-out space on the ground floor served by a 15-ton bridge crane. From then on the buildings were finished in quick succession including the plate and angle shop 150 feet long and 35 feet wide and the furnace and forge shop 100 feet square, until on July 10, 1939 all of them were completed and in operation. Power for the plant is derived from a 100-kilowatt converter and an electrically driven 500 cubic feet per minute compressor which delivers air at 100 pounds per square inch while at another point are two 850 cubic feet per minute compressors. The power which amounts to 2,300 volts is



transmitted to sub-stations and there reduced to 440 volts.

A finished material crane runway 625 feet long and 77 feet wide equipped with one 15-ton and one 10-ton bridge crane provides storage space for the fabricated units shipped from the Birmingham shops while at one end is a 72-feet square assembly platen capable of supporting units up to 18 tons in weight.

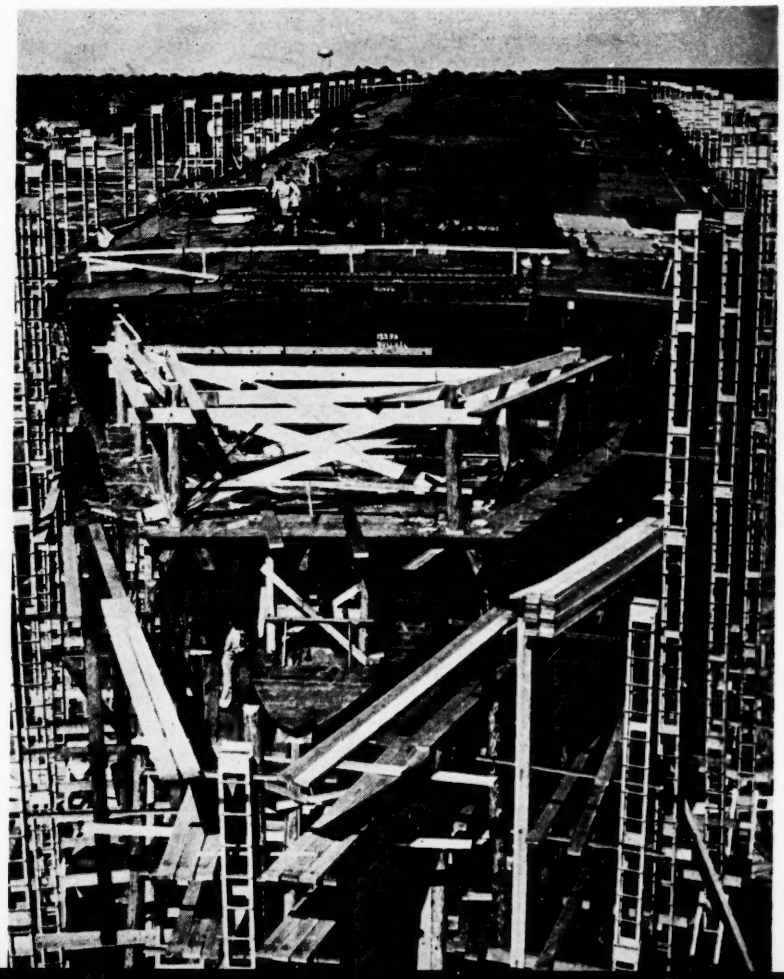
The first two building-ways made of reinforced concrete in a series of horizontal steps with a down-grade of ¾ inch per foot were completed on the first day of July. The third and fourth building-ways, of the same construction as the first and second, were completed on August 1 and December 15 respectively. Building-way number five and any additional ones which may be necessary can be amply accommodated on the remaining 2,000 feet of waterfront. Servicing the building-ways are three gantry cranes, each having a lifting capacity of 35 tons or 75 tons when used in tandem by means of an equalizing bar.

The construction of all-welded ships is very different from that of riveted ships because it does not have the advantage of erection holes and therefore, to expedite economical building, it is essential to fabricate divisions of the entire structure in as large units as may be welded on the assembly platens and hoisted into place by the gantry cranes. When a sufficient quantity of units have been fabricated, the flat keel is laid and followed by the flat portion of the bottom shell, after which the foundation continues, to erect thereon the remainder of the ship in its various units.

It is interesting to note that in construction of the individual units, as many as possible are assembled upside down in order that most of the Unionmelt welding shall be downhand welding.

"The method decided upon for the erection of the structure above the inner bottom is believed to be a somewhat new and novel one, and is certainly radically different from the accepted practice of structural erection. As all of the lower side framing terminates at the inner-bottom margin plate and the under side of the third deck, thereby providing no

(*Continued on page 62*)



Above—Panoramic view of the Pascagoula yard showing principal buildings, store yard, and 4 ships in course of construction. Right—Stern view of hull No. 255.

UNITED STATES TRADE WITH SCANDINAVIA

THE expansion of hostilities to Scandinavia and extension of United States neutrality proclamations to cover this territory not only cuts off the last existing port of call for American ships in northern Europe, but it also has significance because of the further disruption of international commerce. Already the effects of the war on this country's business have been evident and the South has felt it no less than other sections, principally through the interruption of normal cotton and tobacco trade. Just what the consequences of this new development will be, it is still too early to foresee but it will be of interest and possible value to examine the details of trade between this country and Scandinavia.

While exports from the United States to Norway, Sweden, Denmark, and Finland during the first eight months of 1939 increased over the corresponding period of 1938 only 10 per cent, in the last four months of 1939 the increase mounted to 78 per cent, and for the six months—September, 1938 to February, 1940, there was a gain of 81 per cent over the corresponding months a year earlier according to the United States Bureau of Foreign and Domestic Commerce.

In value, the trade in 1939 reached $166,000,000, representing an increase of $42,000,000 over the $124,000,000 total in 1938 and $30,000,000 above the average of the five-year period 1926-30. In percentage of total United States exports, the four countries took 5.2 per cent in 1939 as against 4.0 per cent in 1938 and 2.9 per cent in 1926-30. In the six months from September, 1939 through February, 1940 the percentage rose to 5.8 per cent.

Exports to Denmark and Norway alone amounted to approximately $56,000,000 in 1939 or 1.8 per cent of this country's total export trade.

In considering the changes in value of this export trade noted above, and especially during the most recent months, it is necessary to bear in mind that for several years there has been a tendency away from indirect trade via other European countries and toward a greater preponderance of direct shipments to the northern countries; also, heavy purchases for emergency reserve purposes were made by all four nations during 1939. Finally it must be remembered that trade control measures, mostly of a supervisory rather than a restrictive nature, have been put into effect.

In 1938, Denmark, with about 70 per cent of its imports subject to licensing for the purpose of exchange control, was the only one of these countries resorting to strict governmental control of foreign trade. Following the outbreak of war, all four countries immediately placed a long list of exports under control, primarily to conserve domestic supplies, while special boards and ministries were established to supervise foreign trade, and certain fuels such as petroleum, coke, and coal which were made subject to special import control. Except for Denmark and Finland, the trade control measures adopted *after* the outbreak of war were intended to be generally supervisory. Many internal taxes, including those on luxury items, were raised to provide defense funds, and an informal exchange control by the banks was put into effect toward the end of the year. The only imports into Denmark not subject to import license at the close of 1939 were a few articles of very minor importance. In weighing the effect of exchange and trade

EXPORTS

Principal United States Exports to Norway

	1938	1939
Total, all exports	$22,567,000	$32,103,000
Animals & animal products	435,000	1,957,000
Vegetable food products, total	4,622,000	5,850,000
Corn	513,000	.....
Wheat & flour	1,129,000	1,129,000
Oilcake & meal	189,000	859,000
Oranges	564,000	497,000
Refined sugar & syrup	15,000	1,759,000
Vegetable products, inedible, total	1,639,000	3,058,000
Rosin	94,000	215,000
Soybeans	.....	164,000
Tobacco	1,091,000	1,874,000
Textile fibers & manufactures, total	1,190,000	2,452,000
Cotton	689,000	1,418,000
Wood & paper	646,000	755,000
Nonmetallic minerals, total	2,296,000	4,383,000
Bituminous coal	38,000	186,000
Petroleum & products	1,999,000	3,568,000
Metals & manufactures	2,736,000	4,983,000
Machinery & vehicles, total	7,538,000	5,759,000
Industrial machinery	1,116,000	1,078,000
Agricultural machinery	350,000	622,000
Automobiles & parts	3,932,000	2,132,000
Chemicals & products	643,000	1,643,000

Principal United States Exports to Sweden

	1938	1939
Total, all exports	$64,227,000	$96,661,000
Animals & products, edible, total	553,000	1,192,000
Animals & products, inedible, total	912,000	1,168,000
Vegetable food products, total	5,481,000	6,184,000
Vegetable products, inedible, total	3,466,000	6,652,000
Rosin	329,000	716,000
Tobacco & cigarettes	1,747,000	3,392,000
Textile fibers & manufactures, total	5,507,000	13,685,000
Raw cotton	4,345,000	11,015,000
Wood & paper	441,000	614,000
Nonmetallic minerals, total	11,372,000	16,004,000
Petroleum & products	9,353,000	13,119,000
Abrasives	671,000	1,014,000
Crude sulphur	106,000	231,000
Metals & manufactures, total	7,663,000	15,596,000
Pig iron	70,000	1,323,000
Iron & steel scrap	.....	1,037,000
Iron & steel plates	965,000	1,990,000
Black steel sheets	325,000	1,055,000
Tin plate & taggers' tin	401,000	1,269,000
Ferro-alloys	913,000	393,000

Refined copper	3,618,000	5,623,000
Aluminum & manufactures	99,000	201,000
Machinery & vehicles, total	24,383,000	25,460,000
Industrial machinery	2,923,000	4,041,000
Agricultural machinery	2,283,000	3,188,000
Tractors & parts	1,962,000	2,795,000
Automobiles & parts	13,491,000	12,252,000
Chemicals & products	2,479,000	4,246,000
Phosphate rock	632,000	510,000

Principal United States Exports to Denmark

	1938	1939
Total, all exports	$24,814,000	$23,882,000
Animals & animal products, total	338,000	266,000
Vegetable food products, total	7,187,000	2,632,000
Vegetable products, inedible, total	1,580,000	2,373,000
Naval stores	103,000	164,000
Soy beans	31,000	421,000
Tobacco & cigarettes	1,022,000	1,134,000
Textile fibers & manufactures, total	1,781,000	2,243,000
Raw cotton	1,701,000	1,990,000
Wood & paper, total	606,000	656,000
Nonmetallic minerals, total	4,596,000	6,827,000
Petroleum & products	4,229,000	6,011,000
Metals & manufactures, total	688,000	1,256,000
Machinery & vehicles, total	7,078,000	6,436,000
Automobiles & parts	6,519,000	5,813,000
Chemicals & products	589,000	535,000

Principal United States Exports to Finland

	1938	1939
Total, all exports	$11,991,000	$13,442,000
Animals & animal products, total	201,000	112,000
Vegetable food products, total	1,329,000	1,797,000
Refined sugar	.....	967,000
Vegetable products, inedible, total	513,000	541,000
Tobacco	218,000	219,000
Textile fibers & manufactures, total	2,299,000	1,311,000
Raw cotton	2,015,000	1,123,000
Nonmetallic minerals total	1,309,000	1,639,000
Petroleum & products	1,021,000	1,270,000
Metals & manufactures, total	1,624,000	2,267,000
Machinery & vehicles, total	3,844,000	4,596,000
Industrial machinery	647,000	544,000
Agricultural machinery	399,000	517,000
Tractors & parts	311,000	390,000
Automobiles & parts	1,849,000	2,013,000
Chemicals & products	425,000	460,000

IMPORTS

Principal United States Imports from Norway

	1938	1939
Total, all imports	$16,533,000	$21,825,000
Fish	3,450,000	4,742,000
Whale oil	567,000	539,000
Cod & cod-liver oil	1,526,000	1,766,000
Wood pulp	3,771,000	3,822,000
Standard newsprint	424,000	1,473,000
Ferromanganese & metals	2,339,000	3,693,000
Fertilizers & materials	2,688,000	2,393,000

Principal United States Imports from Sweden

	1938	1939
Total, all imports	$45,067,000	$42,100,000
Wood pulp, total	32,052,000	29,053,000
Sulphite	18,062,000	15,942,000
Sulphate	13,983,000	12,213,000
Standard newsprint	2,859,000	2,301,000
Kraft & other wrapping paper	528,000	459,000
Metals & products	4,900,000	5,577,000

Principal United States Imports from Denmark

	1938	1939
Total, all imports	$3,598,000	$3,775,000
Food products	1,871,000	1,530,000
Crop seeds & inedible vegetable products	508,000	530,000
Textile fibers & manufactures	43,000	113,000
Hydraulic cement	282,000	484,000

Principal United States Imports from Finland

	1938	1939
Total, all imports	$18,071,000	$20,665,000
Wood pulp	10,218,000	11,483,000
Standard newsprint	5,414,000	6,590,000
Wrapping paper	542,000	559,000
Granite	214,000	130,000
Cobalt metal	281,000	277,000
Cobalt oxide	120,000	160,000

control measures upon imports into these markets last year, it should be remembered that the governments of all four countries made heavy purchases for emergency reserve purposes.

United States Exports

The principal commodities exported from the United States to these northern countries in 1939 were automobiles, machinery, petroleum and its products, raw cotton, iron and steel, copper, foodstuffs, and tobacco. Larger direct shipments of a number of these products, especially cotton, iron and steel, copper, petroleum and products, and several foodstuffs account mainly for the increased value of exports in 1939. Exports of cotton to the four countries combined amounted to 285,000 bales in 1939 as compared with 169,000 bales in 1938. Iron and steel to Norway reached 42,533 tons against 12,152 tons in 1938, and to Sweden 146,226 tons against 31,418 tons. Shipments to all four nations of motor trucks were also larger in 1939 than in 1938 but exports of passenger cars to Sweden and Denmark, and of motor trucks and cars to Norway declined sharply.

Exports of vegetable food products to Norway, Sweden and Finland increased in value, but shipments to Denmark declined. The decline in the latter's purchases being mainly in grain and oil cake, owing to unusually large Danish crops in both years.

A large percentage of exports to these countries originates in the Southern states.

Wood Pulp and Newsprint Lead U. S. Imports

Wood pulp imports from Norway, Sweden and Finland constituted 64 per cent of the total quantity of United States imports of wood pulp in 1939 as compared with 66 per cent in 1938. This represents approximately 14 per cent of our consumption of wood pulp.

Four-fifths of this country's total imports from Sweden, nine-tenths from Finland and over one-fourth from Norway are of pulp, paper and paper materials. Imports of wood pulp from Norway and Sweden have increased substantially since the outbreak of war. The low prices of wood pulp prevailing in the first three quarters of 1939 held down the value of our total wood pulp imports from these countries.

Although imports of newsprint from the area declined heavily after hostilities started, receipts of this commodity from Finland and Norway for the year as a whole set a new record. Imports of newsprint from these three countries amounted to 11 per cent of the total newsprint imports into the United States in 1939. Imports from Finland ceased early in December when that country was

(Continued on page 66)

SIMPLIFYING COST ACCOUNTING

STREAMLINED to efficiency — that's the Caspers Tin Plate Company of Chicago, one of the country's largest lithographers on metal!

Note its sleek new plant, recently constructed to house lithographing facilities for producing the approximate 6,500 designs carried for lithographing on tin and black plate.

The rounded corners of the building in themselves are symbolic of how this company has cut other corners in its operating and administrative policies—why a single modern accounting machine is able to handle not only the accounts receivable, accounts payable, payroll, and sales summary records, but also a complete cost accounting system.

Prior to its present set-up, the company was keenly aware of a direct need for mechanical accounting equipment to handle day-to-day office routine. On an average, about 60 charges a day were being posted by hand to receivables. Twenty incoming invoices each day meant a daily handling of that many accounts if payables were to be kept up to date. Nearly 400 checks were sent out each month. The regular payroll included approximately 200 workers on an hourly rate. And, about 500 job cost tickets came through the accounting department each month.

"None of these jobs taken by itself could economically justify the investment in an office machine," says Mr. K. Van Wyngaarden, Secretary of the company. "The ideal solution — one which we planned and are now enjoying—was to install a single, flexible, and interchangeable unit to accommodate all our accounting records with regularity, speed, and accuracy."

So comprehensive and complete is the work which this single Burroughs machine now does that it has effected a *general* accounting plan in the Caspers office —a hub around which the rest of the office activity revolves.

Cost accounting is the biggest detail job handled. Under the old system, it took more time and details for rewriting and recapping cost figures than it did for all the rest of the accounting work put together, according to Mr. Leslie Cox, chief cost accountant.

Cost tickets for both materials and labor came into the office where they were recapped by job and classifications. Burden was calculated from this, and totals extended and again recapped.

In the process of repetitive copying and recapping the figures on different forms to get totals for a cross balance, errors frequently occurred, in spite of the care exercised. Valuable time had to be spent in tracing the errors.

The cost tickets are now brought in from the plant each day, with time and material figures already partially computed by the timekeeper and the foremen in the departments. The initial step in the accounting office is to sort these job tickets in classifications by job number and then re-sort them by the types of work done on the job.

The tickets are then given to the accounting machine operator. With a "cost of completed orders" journal remaining in the machine, the operator recaps the job figures on "cost of completed orders" ledger accounts which are kept for every customer. Listing the job order number, the machine operator then distributes the cost of labor and material on the job to the proper classifications shown on these forms: printing, coating, preparation and wash-up, tandem, dual coater, slitting, and waxing.

As each of these items is posted, the machine also calculates the burden on each, accumulating the burden figures and adding them to the labor and material costs from each department for a total on the job, which is then printed in the last column at the touch of the total key.

Since each department carries a different burden rate, there has been probably a 50% saving in time by calculating these amounts at the same time they are written on the cost sheet. The entire step of another handling of these figures is thus eliminated, and the totals extended by the depression of a single key.

With the "cost of completed orders" journal prepared simultaneously as a by-product of writing the customers' cost ledgers, the company is assured of com-

Above—The new plant is located in a growing industrial area in Chicago, and represents the latest in design, equipment, and efficiency.

Right—The bookkeeper is able to maintain a complete set of receivables, payables, payroll, cash, and sales and purchase distribution records—to say nothing of a cost accounting system as streamlined as the plant itself.

plete agreement between the records.

Formerly it took one operator two weeks out of every month to get departmental summary cost figures. Now, with the job cost totals completed for each line of posting, the operator is able to take cost figures two and three times a month. A grand total of costs per job per department is ready at the end of the month to be posted to the general ledger.

Burden, calculated once a month for each department, is figured as a flat percentage of the total labor cost for the department.

"For our month-end cost figures," Mr. Van Wyngaarden says, "we thus have the journal record which gives us an integrated cost of every job, a summary of jobs for the customer during the month, and totals for departmental costs, as well as carrying forward at all times the standard manufacturing cost.

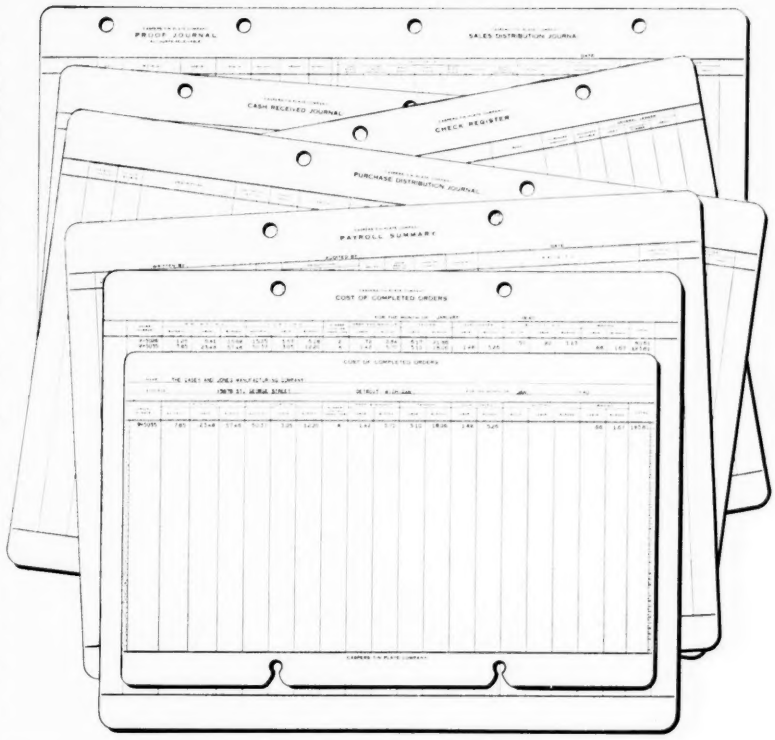
"Our monthly cost summary reports are providing the various departments with information for setting up current standards. These reports help the operating department focus attention on variations from the established standards of production and expense. And, in addition, the summary figures also serve as a current monthly, work progress history.

"Not only has the actual work of computing and writing been reduced, but we are getting the figures to the cost records every day. The monthly costing peak operation has been leveled to the extent where, in comparison to former costing methods, it scarcely is noticeable."

Payroll acounting represents the second major records-keeping job handled on the Typewriter Accounting Machine. The 200 workers at the plant are nearly all employed on an hourly base. The basis for the weekly payment records is the hours and rates information recorded by a payroll clerk and accumulated daily on time sheets for each worker. Together on the time sheet with the total hours worked and the rate per employees, the payroll clerks compute all deductions, including purchases from the company, group insurance, old age benefit, and any others, to arrive at the net earnings.

Under the former method of assembling, accumulating, computing, and writing the necessary payroll forms by hand, the Caspers payroll work took about a day and a half, and no earnings summary was prepared.

With the new machine, however, the operator is now able to complete the payroll in less than a half day. With a payroll summary form remaining in the machine and being prepared as a by-product of the payroll posting, the operator can also prepare in a single operation the employee's check, earnings record, and receipt, showing the earnings for the period ending, the amount, and the employee's name as required by the new



Actions speak louder than words. Little more needs be said of the many jobs which the single, highly-automatic accounting machine can do.

Social Security ruling.

The typewriter keyboard on the machine enables the operator to write the employee's name and any incidental description. Insertion and alignment of forms is fast and simple.

By direct multiplication, the machine automatically multiplies the number of hours worked by the rate, and automatically prints this total of gross earnings on the records. From the total, all deductions are subtracted, and the net earnings printed on the check, receipt, payroll ledger, and earnings summary.

A proof and control is established if the machine-posted net earnings agree with the amount noted on the time sheet by the payroll clerk. And, as Mr. Van Wyngaarden points out, since the payroll work is being done with such speed and accuracy, this important weekly function does not disturb the daily routine of keeping all the other records posted and up to date daily.

Early each day the accounting machine operator receives duplicate copies of the invoices mailed out, and posts this information to the receivables ledger. The amount of the charge, shown on the invoice, together with the job cost number, are posted to the ledger.

With a sales journal remaining in the machine during the receivables posting and being written automatically, the operator posts a sales analysis by products by customer while she posts, adds, and proves ledger entries.

Such a sales analysis is important for sales promotion. A ready tab on what every customer is buying, how much, and how often indicates how sales effort can best be applied in an objective direction. No longer must the sales department work from sales totals alone, since these individual sales analysis now give a concise sales history of every account carried on the books.

From the sales journal, which provides total sales by products, the company also has a concise record of what all its customers are buying each day.

"The 'sales by customers' ledger card is an ideal companion piece to our 'cost by customers' ledger," says Mr. Van Wyngaarden. "In practice, we can easily subtract this cost figure from the sales figure on every job and have a gross profit amount for the job."

Cash received is credited to the customer's ledger at a separate posting, and duplicates to a cash received journal. The proof and balances are automatically printed by the machine on this journal, which provides a daily total of cash taken in.

With the accounts payable records also kept on the machine, a triplicate voucher form is used, with a check attached at the bottom. As the invoices come in, they are checked and verified before the bookkeeper gets them.

Described and listed on the voucher, the invoice is then distributed on the purchase journal, which is prepared at the same time. Payables are posted three

(*Continued on page* 66)

ALABAMA STATE DOCKS EXPANDS BULKHANDLING PLANT

BY

J. B. Converse,
Consulting Engineer

A NEW addition for handling bulk materials at the Alabama State Docks, at a cost of $350,000, has just been completed and put into operation.

The plant makes provision for unloading bulk material from ships by using either of the two existing gantry towers or by ships tackle to a hopper constructed in the wharf structure.

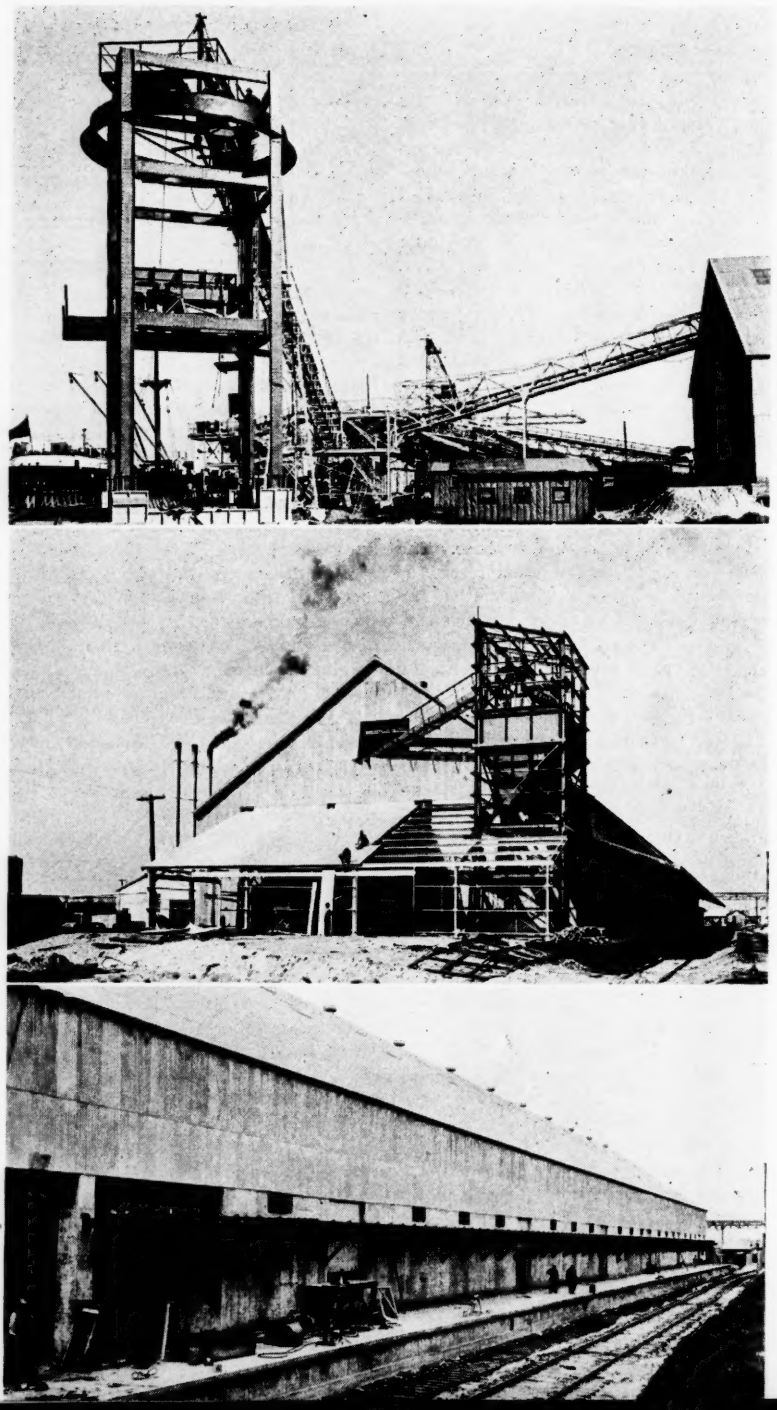
The plant is very flexible and is so arranged that the following operations can be performed:

(1) From ship to storage with weight scale
(2) From ship to carloading bin with weight scale
(3) From storage to sacking bin
(4) From storage to carloading bin.

The storage building of 50,000 ton capacity, is 500 feet long by 100 feet wide. The reinforced concrete side walls are designed as retaining walls and the steel columns and trusses rest on the side walls. A trucking platform at car door height is provided on one side of the building. The bulk material is brought into this building by 700 tons per hour capacity conveyors on the wharf to a conveyor running the length of the building and located at the high point in the roof trusses. This loading-in conveyor is equipped with a tripper and also passes over a Merrick Weightometer. The conveying equipment is from the Jeffrey Manufacturing Co.

For delivery of material to the carloading bin, the same method of unloading the ship at the wharf is followed; however, when the material reaches a five way tower outside of the storage

(*Continued on page 58*)



Top—The extensive conveyor system to transfer bulk cargo from ship to storage. Center—One end of the storage building almost completed. Bottom—The reversible conveyor along the side of the storage building.

WHAT'S THE CAUSE OF ANTI-AMERICAN ISMS?

BY

Dr. John J. Wicker

President Fork Union Military Academy, Fork Union, Virginia

MILLIONS of people are asking today, "What is the matter with the country?"

"What is the matter especially with our young people?"

"Why is there so much discontent?"

"If there is a growing communism, socialism, or bolshevism or any other anti-American ism, what is the cause?"

"What has given birth to such conditions?"

Everybody knows that we have these undesirables and this in the face of the finest living standards, with the greatest number of luxuries ever known in any country, in any age. Why, then, the unrest?

The answer is, that the very thing that ushered in all the luxuries, also brought the unrest. The luxuries were readily absorbed but we have not yet succeeded in adjusting our social and economic life to neutralize the unrest.

If we educate a man's appetite beyond his ability to provide the food he craves, or beyond the ability of the economic order of things to provide, then, it goes without saying, that we have great discontent, which discontent will either find a way of satisfying its ever increasing appetite or become bolshevik.

But when, through public schools, secondary schools, universities and otherwise, a nation educates its people to a realization or consciousness of what they do not possess, and creates in that very education an ever-growing desire to possess, trouble is inevitable, unless, at the same time, in the person so educated there be injected those characteristics of manhood, character, determination, and sweat and battle to obtain by their own efforts the things for which they have an unconquerable desire. Education administers a tonic to appetite which, unsatisfied, or uncontrolled, becomes a dangerous thing.

We need first a reformation in the rearing of our children. The child must be taught to work, to produce as well as consume, and to learn to have as much pleasure in the pursuit of a thing as in the possession of it.

After associating with hundreds of boys daily for a period of ten years I am fully convinced that boys of today would not be different in character from the boys in the days of Abraham Lincoln, log-cabins and plowing oxen on the hillsides, if suitable training was provided, to match present day conditions. Human nature is just the same as it always was and always will be.

Responsibility must begin before a child is five years of age.

I know a mother who required her child to keep every garment in place every day, and to keep his room in order. That boy in college has adhered to his training and has one of the best kept rooms in the dormitory.

I know another mother who had the servant to pick up and put away the child's clothing. Today, in college, that boy's garments can be found scattered over the floor every day in a room full of confusion.

Why are individual boys in the same institution so different? The answer is "back home." They came to school different because they had been reared differently.

There is no objection to young people desiring more. Luxury and everything good is desirable. Indeed it is a good thing they do desire it, provided the wish is matched with a determination to honorably obtain these things by the sweat of one's own brow.

But today, from the home all through the social and political structure we are inviting our young people in the opposite direction from the fundamental laws of life and character building.

We are being told:

To plow under wheat and have more hot biscuits.

To raise fewer hogs and have more hams.

To go deeper in debt and get the country out of the red.

To do less and get more.

To build character through the belly on free grub.

To make more muscle on less exercise.

To reverse all the biological laws in character building and make bigger, better men.

How a father can make a great man of his son by practising the New Deal on him. When the job is finished the father will have a small animal with unusually long ears.

This is the great job the "Brain Trusters" have undertaken.

It would be a great service to organize a union that could run the country on New Deal principles, with shorter hours and bigger wages.

Success would bring great relief to many hard-pressed corporations and bankrupt railroads and at the same time declare larger dividends for stockholders.

They would then know how to successfully do it.

The graduating classes in this superior business wisdom would be in great demand, and this would immediately solve the ever-growing problem of positions for college graduates.

A college built on such philosophy ought to have a great student body, but I doubt if its alumni would ever be able to add anything to its endowment.

Theories can live on "hot air" and other people's money, but it takes cold facts to put life in real structures.

You just cannot change fundamentals by stamping a new label on them.

You cannot build big hotels out of profits from free boarding house patrons.

(*Continued on page* 66)

NATURAL GASOLINE PLANT COMPLETED IN ARKANSAS

Five Compressors Have Capacity of 13,000,000 cubic feet of Gas Daily

DURING February 1940, Shell Oil Company, Incorporated, completed and placed on production a natural gasoline extraction plant in the Magnolia Field, near the town of Magnolia, Columbia County, Arkansas. The plant, while operated by Shell, is owned jointly by Shell, Atlantic Refining Company, G. H. Vaughn, Leon F. Russ, Jr., et al. It was designed and constructed on a "turn-key" basis by the Gasoline Plant Construction Corporation, of Houston, Texas. It is of the compression-absorption type, the five compressors now installed having a capacity of 13 million cubic feet of gas daily, with an average daily production of 28,000 to 30,000 gallons of 26-70 grade natural gasoline and 10,000 to 13,000 gallons of butane. The process equipment is capable of handling 15 million cubic feet daily, and by installing additional compressors the daily production can be readily stepped up to 35,000 gallons of 26-70 grade natural gasoline and 15,000 gallons of commercial butane. Gas for the plant is gathered by means of a welded pipe system, painted and wrapped for protection from corrosion.

The gasoline and butane are sweetened or deodorized before being passed to storage. Dry gas for gas engines is treated by the Shell Phosphate Process for the removal of hydrogen sulphide. Pressure storage facilities for 240,000 gallons of natural gasoline and 100,000 gallons of butane are provided.

The plant's production is being moved to market by railroad tank cars. Loading is handled through two pipe lines to a steel loading rack on the railroad some six miles distant. Eight natural gasoline and two butane cars can be loaded at one spotting.

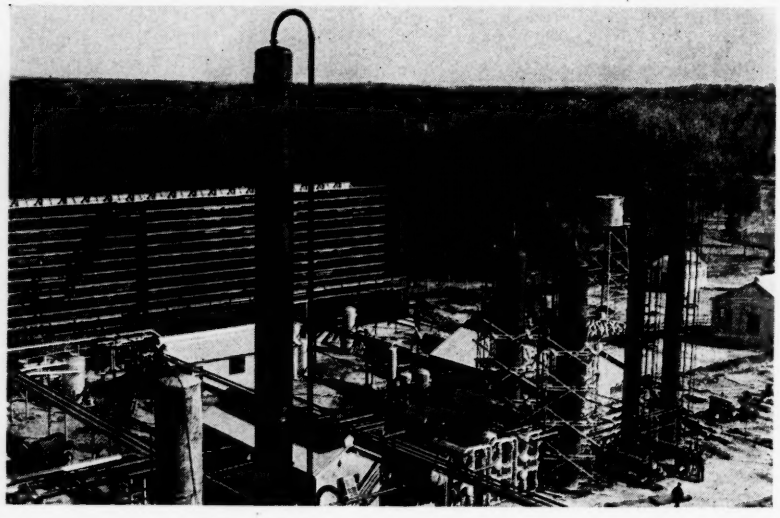
The major equipment was supplied by the following firms:

Steel Buildings: Allied Steel Products Corp., Tulsa, Okla.

Vessels: Wyatt Metal & Boiler Works of Houston and Dallas, Tex.; Tulsa Boiler & Machinery Co., Tulsa, Okla.; J. B. Beaird Corp., Shreveport, La.

Engine and Pumps: Ingersoll-Rand Co., Houston, Tex.; Worthington Pump and Machinery Corp., Tulsa, Okla.

Boiler & Electric Power: Kewanee Boiler Works, Kewanee, Ill.; Lycoming Manufacturing Co., Williamsport, Pa.



Pipe: The American Rolling Mill Co., Middlebrook, Ohio; National Tube Co., Pittsburgh, Pa.; Republic Steel Corp., Cleveland, Ohio.

Meters & Controls: Westcott & Greis, Tulsa, Okla.; Brown Instrument Co., Philadelphia, Pa.; Hanlon-Water, Inc., Tulsa, Okla.

Miscellaneous: Crane Co., Chicago, Ill.; Merco-Nordstrom Valve Co., Pittsburgh, Pa.; Refinery Supply Co., Tulsa, Okla.; Western Supply Co., Tulsa, Okla.; C. F. Pritchard Co., Kansas City, Mo.; Chase Brass & Copper Co., Waterbury, Conn.

Test Plant For Making Iron From East Texas Ore With Natural Gas

BY

Julian Capers, Jr.

East Texas Chamber of Commerce

IN order to make commercial tests of the Madaras process of refining East Texas iron ore by means of natural gas, a pilot plant is now under construction at Niagara Falls, New York, according to information received at Longview, Texas, by officials of the Madaras Steel Corporation of Texas. Completion of the plant, which has a capacity of five to seven tons of ore at one charging, is expected to be made by the latter part of June when test runs will be made immediately.

Construction of the pilot plant has been somewhat delayed as a result of the various problems which arose in the designing of the special equipment made necessary by the revolutionary character of the Madaras process. This process, which uses natural gas at comparatively low temperatures to reduce the powdered ore to sponge ore of high quality, entirely omits the necessary pig iron stage when the conventional coke and limestone blast furnace method of reduction of ore is utilized.

Present plans call for three months of testing operation of the pilot plant, in order to assemble complete data for construction of the first commercial plant to utilize the process, which plant is to be built by the Madaras Steel Corporation of Texas, somewhere in the East Texas

(*Continued on page* 48)

77 NEW INDUSTRIES LOCATED ON NORFOLK & WESTERN RAILWAY IN 1939

Due to generally improved business conditions prevailing during 1939, an encouraging and stable industrial growth in the territory served by the Norfolk and Western Railway was noted in the annual report of T. Gilbert Wood, N. & W. Industrial and Agricultural Agent.

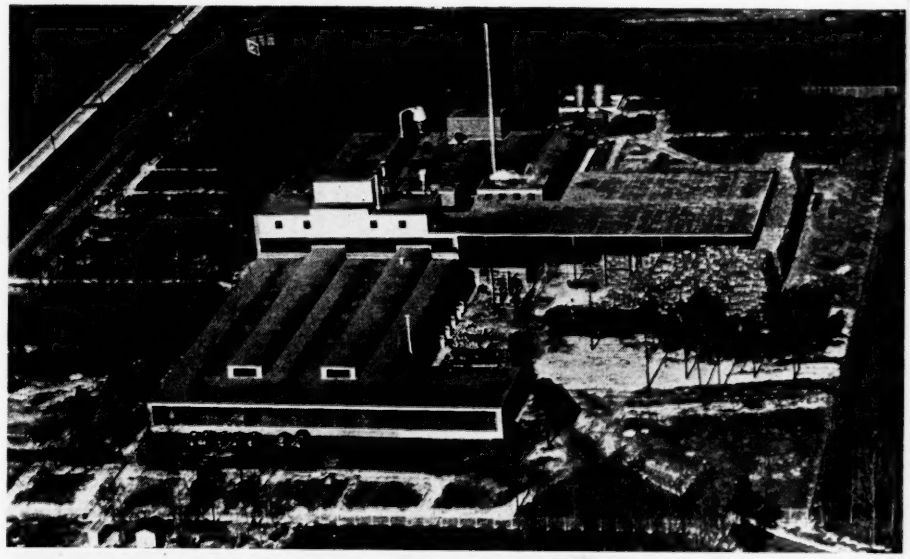
The report presents complete statistics as to the number of new plants directly served by the Norfolk and Western and in tributary territory; additions made to plants on the line adjacent to the railway system; and burned plants rebuilt on, and continguous to, the N. & W. The Norfolk and Western bisects the state of Virginia; extends south into North Carolina at Durham and Winston-Salem; north to Hagerstown, Md.; west from Norfolk to Cincinnati and Columbus, traversing through the vast coal fields of West Virginia, and eastern Kentucky; and from Roanoke southwest to Bristol, Va.-Tenn.

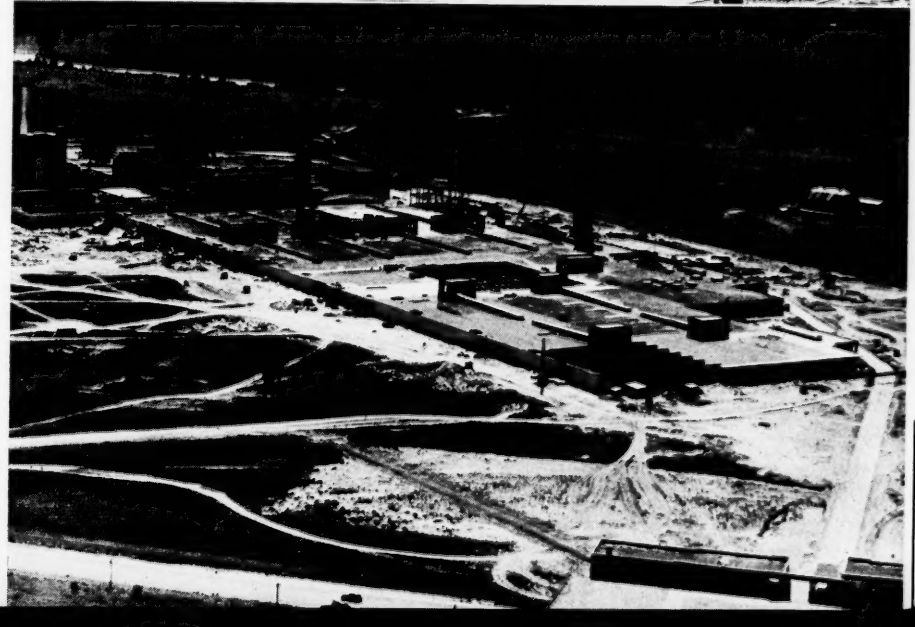
Last year 199 new plants and additions, with a total capital investment of $19,082,890 and employing 7,152 persons, were established in Norfolk and Western and tributary territory. In number of plants established, 1939 was second only to 1937, when 204 new plants and additions were reported. The 1939 report shows an increase of 41 plants over 1938, and an increased capitalization of nearly a million dollars.

The report states, in part:

"The rapid development in our chemical industries and the creation of new

(*Continued on page* 60)





Three of the several large industrial plants located on the N. & W. Railway. Top—The new cork plant of Mitchell and Smith, Inc., an industry of international importance, is now in full operation at Sewalls Point (Norfolk) Va. The plant includes a main building, 280 feet by 220 feet constructed of steel, brick, concrete, and much special structural glass, with two smaller adjoining units. The Lambert Point site for Mitchell and Smith was selected after the concern had investigated possible locations along the seaboard from New York to New Orleans. Center—Modernistic Southern Dairies plant at Christiansburg, Va. Bottom—Front Royal, Va., newest and second plant of the American Viscose Corp., to be established on the N. & W. Railway.

INDUSTRY'S NEWEST TOOL-- THE FLUORESCENT LAMP

BY

Charles L. Amick

General Electric Company
Nela Park Engineering Department
Cleveland, Ohio

A QUARTER of a century ago executives were faced with the task of expanding to meet the demands of the first World War. Plants were enlarged, new machinery was purchased, extra shifts were added. And later someone thought of more light. In Virtually every case an improvement in industrial lighting brought about decreased production costs. Executives were surprised to learn that that increased production more than paid for the cost of the better lighting. The present lighting dollar purchases 10 times as much light as it did in those days which means that if the executive will only spend as much for lighting his plant today as he did some 25 years ago, he will have an excellently lighted factory.

Certain branches of industry are faced with this problem today. But they are fortunate in having light sources available which enable the attainment of illumination levels known to be needed. Among these is the Mazda F (fluorescent) lamp which offers

1. Daylight-quality lighting at an efficiency never before possible.
2. The attainment of high-levels of lighting without discomfort from radiant heat.
3. The possibility of increasing illumination levels by using these more efficient sources on existing wiring.

These and other features of the Mazda F lamp make it a light source worthy of present-day attention.

This lamp is a long, hollow tube, internally coated with fluorescent chemicals and having electric discharge elements at each end capable of producing an abundance of "black light" for exciting the phosphors. Differing from ordinary filament lamps, these tubes contain only mercury vapor to conduct electric current from one end to the other. The discharge which results when fluorescent lamps are connected with proper auxiliary equipment to sources of electric power is similar in apparent color to other mercury lamps. The discharge in these now tubes is, however, rich in ultraviolet radiation which is converted by the fluorescent powders into visible light, the color depending on the composition of the powders.

Above—Continuous rows of RLM fluorescent fixtures provide 40 foot candles of well distributed illumination for this factory area. White lamps are used. Individual bench units used by the workers in the foreground supply the added illumination needed for the more critical seeing tasks.

The theory of fluorescence introduces more complications than those involved in the production of light by mercury, sodium, neon or other types of electric discharge. Materials which fluoresce under the action of ultraviolet radiation simply absorb energy at one wavelength and reradiate it at longer wavelengths in much the same way as a transformer takes power at one voltage and delivers it at a different voltage. Fluorescent reradiation is, however, spread over a considerable range or continuous band of visible wavelengths.

Fluorescent lamps are now available in five lengths; 18, 24, 36, 48 and 58 inches. These lamps consume 15, 20, 30, 40 and 85 watts respectively. The 18- and 36-inch lamps are one inch in diameter, the 24- and 48-inch 1½ inches in diameter, and the 58-inch Type RF lamp has a 1¼-inch bulb. The daylight Mazda F lamp has a color temperature of 6500°K which is a very close match for average daylight. The white Mazda F lamp emits light which is similar to that of filament lamps. The 85-watt Type RF lamp for general industrial lighting is available in the blue-white and the white color and is used in equipments specially designed for it. Cooper Hewitt (Type RF) fluorescent luminaires using one or two of these 85-watt sources are now on the market.

Since the fluorescent lamp is an electric discharge source, it requires auxiliary control equipment. The auxiliary consists of two principal elements, (1) an iron-core choke coil which limits the current to the value for which the particular size of lamp is designed, and (2) a starting switch which momentarily closes and then opens the electrode heating circuit. Hot cathode starting permits relatively low-voltage operation.

The auxiliary system in widest use now employs a ballast choke and a replaceable starter as separate units. The moving parts of the automatic starting switch make it the element most likely to cause trouble, either by breakage in shipment or in usage, and with former systems a faulty switch meant tearing up the wireway and replacing the complete auxiliary. The present replaceable starter consists of a thermal glow switch and radio-interference condenser in a small aluminum can, connected as shown in the diagram. The starter socket can be located anywhere, though often it is mounted with one lampholder, the end of the starter projecting through the reflector for easy relacement.

Because the fluorescent-lamp ballast is simply a coil of wire wound on an iron core, it introduces a consideration of power factor. However, with the advent of Tulamp ballasts this problem has been largely overcome. These Tulamp ballasts use the "split-phase" principle with one of the lamps ballasted by inductive reactance only, and the other by inductance and capacitance in series. The result is an over-all power factor of 95 per cent or more and at the same time the stroboscopic effect is reduced because of the phase displacement in the two branches of the circuit. High power factor single-lamp ballasts are also available and contain a shunt capacitor which gives a power factor of 90 per cent or higher at

rated volts. High power factor equipment means that the customer can best utilize present wiring capacity. Ballast equipment for 18- and 24-inch lamps is rated at 110-125 volts; for 36- and 48-inch lamps 110-125, 199-216 or 220-250 volt equipment may be purchased.

All light sources used on a-c circuits have a variation in light output because of cyclic changes in current. This flicker is not noticeable with the usual sizes of filament lamps operated on 60-cycle power. In electric discharge lamps (where practically no energy is stored as it is in the hot tungsten of filament lamps) the effect of flicker is much more pronounced. Fluorescent materials, with the possible exception of that producing blue light, have some phosphorescence or persistence of glow so the light output never falls to zero. However, noticeable flicker is rarely an advantage and in some cases may be a definite disadvantage. The use of Tulamp ballasts reduces stroboscopic effect. In cases where this effect must be almost completely eliminated and three phase power is available, lamps may be operated on the different phases.

In general, Mazda F lamps lose their usefulness because of decrease in light output before they fail to operate. All these lamps have a rated average laboratory life of 2500 hours. Frequent starting may take more life out of the electrodes than long hours of burning, because momentarily on starting there is a higher than normal voltage drop at the electrodes which causes the active material to sputter or evaporate off. Sometimes the end of life is indicated by the lamp flashing and then going out.

These lamps may be used on direct current circuits if the specifically designed d-c auxiliary and approved series resistance of the curent value are employed. Direct-current operation, however, usually results in decreased over-all efficiency of light production, useful lamp life, light maintenance and starting reliability. Present tests indicate that only the 18- and 24-inch lamps should be used on direct current.

An outstanding feature of the lamps is

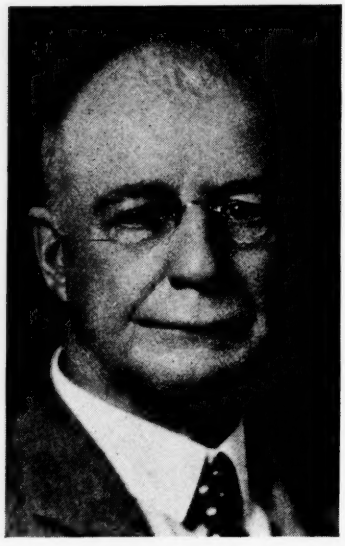
(*Continued on page* 64)

Top—A business office lighted with the direct-indirect type of luminaire using four 48-in. Mazda F lamps. Plastic sides make the unit luminous over-all and the open bottom with egg-crate louvers prevents dust or insect collection. Center—Full-fashioned hosiery machines lighted with 30-watt fluorescent trough units mounted about 40 inches above the knitting area. The illumination level is 40 footcandles. Bottom—Using "troffers" (continuous coffer troughs) recessed in the perforated metal acoustical ceiling. These office workers have 50 footcandles of white fluorescent lighting. Louvers are used to shield the lamps length-wise.

AN OUTSTANDING FINANCIAL ENTERPRISE

ONE of the outstanding banking institutions of the South is the First and Merchants National Bank of Richmond, which in April of this year passed its seventy-fifth anniversary. A chronicler of the event remarks, "as if to observe fittingly the diamond anniversary, plans already have been announced for a $400,000 addition to the bank building at Ninth and Main Streets, on which work is now proceeding."

Headed by John M. Miller, Jr., Chairman of the Board, there are 22 directors and 26 officers, with H. Hiter Harris, president.



John M. Miller, Jr.

The history of this largest bank of Virginia, and one of the 100 largest in the nation, is interwoven with the progress of the Old Dominion and the South. Richmond had been evacuated only three weeks in the War Between the States before the bank was organized. The business section of the city was burned and only two buildings were standing in the area.

When the Confederate soldiers returned from Appomattox they found Richmond's commerce destroyed, her social system disrupted, with apparently nothing left but real estate and the indomitable pluck of her people.

The first meeting of stockholders was held April 24, 1865, and the original Richmond directors were Franklin Stearns, Horace L. Kent, Wellington Goddin and Charles Palmer.

The bank was opened for business in the old Custom House in a room facing Bank Street. One of its early depositors was General Robert E. Lee. His original signature in the signature book of the bank is one of its most treasured possessions.

The demand for funds caused the doubling of capital in July of the first year, and at the end of 1865 a dividend was declared. Richmond was building up and getting ready for the future.

In January 1866, General Joseph R. Anderson, David J. Saunders, D. von Groning and John K. Childrey were among those chosen directors.

A consolidation was affected with the National Exchange Bank in December of 1867. From then on progress continued. In 1880 deposits were $905,000, and in 1885 the bank's capital had grown from $100,000 to $600,000, with a surplus of $300,000.

In 1891, Isaac Davenport, Jr., who had been president for 24 years, resigned because of ill health. Aubin L. Boulware succeeded him and served until his death in 1897. Following that came Virginius Newton who was president until 1904 and was succeeded by John B. Purcell who was elected following Mr. Newton's death.

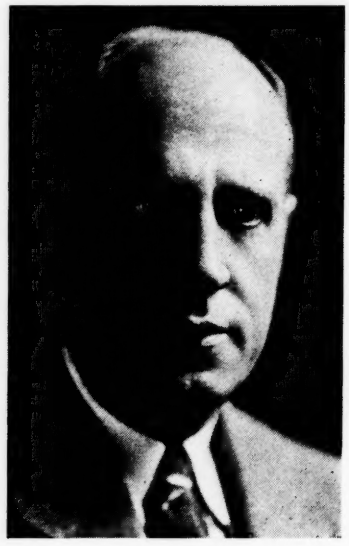
John M. Miller, Jr., cashier of the Merchants and Farmers National Bank of Charlotte, North Carolina, on December 24, 1901, was elected cashier of the Richmond bank to take office February 1, 1902. President Purcell, referring to this later, said: "the election of Mr. Miller inaugurated a new era in the bank, and from this time on the growth of the institution was marked and most satisfactory."

Resources having grown to more than $6,000,000 by 1903, it was decided in 1906 to increase the capital from $600,000 to $1,000,000, with a surplus of $600,000. Five years later, in 1911, the resources had increased to $10,500,000.

The home of the bank has been since 1912 in a twenty-story building erected at Ninth and Main Streets, and it was in that year that Mr. H. Hiter Harris, now president, became associated with the bank. On October 4, 1916, Mr. Miller succeeded Mr. Purcell as president, and for 23 years, until January 12, 1939, Mr. Miller served in that capacity. At that time Mr. Miller was elected Chairman of the Board of Directors, in which office he is still active. Mr. Harris succeeded Mr. Miller as president.

An important consolidation occurred March 1, 1926, when the First National Bank and the Merchants National Bank were brought together under the present name.

Giving an idea of the growth of the institution, the bank's resources in 1930, ten years ago, were $46,000,000, and on March 26 of this year they stood at $84,000,000. Capital is now $3,000,000 and surplus $3,000,000, with undivided profits $613,263. Deposits have soared to $77,212,000.



H. Hiter Harris

There are two branch offices—one opposite Broad Street Station, and one in Highland Park, Richmond.

The 75-year history of this bank is coincident with the rise of the South from the days following the Civil War until the present when the eyes of investors and industrialists from all sections are turned toward the country's most promising field of enterprise. Under considerate, careful management the bank's life story is one of helpfulness in the progress of the territory it serves.

THE PULP AND PAPER SITUATION

THE turn which events have taken recently in Europe of extending hostilities to Scandinavia has brought immediate repercussions in the United States concerning our future adequate supply of wood pulp and paper. In the United States we consumed last year nearly nine million tons of wood pulp and produced slightly over seven million tons. Wood pulp imports amounted to approximately two million tons. This, however, is only part of the picture for while we produced nearly 13,500,000 tons of paper we also imported close to 3,000,000 tons exclusive of paper products.

When Finland became involved in war, the question was studied as to the effects it would have on this country. Our imports of wood pulp from Finland amounted to $11,483,000 in 1939, or approximately 16.5 percent of total wood pulp imports. It appears that at least twelve, and possibly more, Finnish pulp and paper mills are located in the area unofficially reported to have been ceded to the Soviet Union under the terms of the recent Soviet-Finnish peace agreement.

Should the territory adjacent to and including the city of Enso be included in the area ceded, the Soviet Union would acquire a portion of the Finnish pulp industry with a capacity for producing annually 176,000 tons of chemical pulp, evenly divided between sulphite and sulphate wood pulp.

Inclusion of Enso in the ceded territory in addition to other cities believed taken would result in a loss to Finland of four sulphite mills with an approximate annual capacity of 270,000 tons and five mechanical pulp mills, one of which also manufactures sulphite pulp, with an annual capacity of about 25,400 tons.

Of the 333,975 tons of wood pulp imported into the United States from Finland in 1939, 184,520 tons were sulphite, 129,307 tons were sulphate, and the remaining 20,148 tons were mechanical pulp.

It is estimated that these imports represented approximately 6.2 percent of our sulphite consumption in 1939, 3.6 percent of the sulphate pulp consumption, and 1.2 percent of the mechanical wood pulp consumption.

No recent accurate statistics are available concerning Finland's current wood pulp and paper capacity, but on the basis of 1937 figures it would appear that 23.4 percent sulphite production, 27.9 percent sulphate production, and 3.4 percent mechanical pulp production is located within the ceded area.

In addition, it is believed that 5.9 percent of newsprint production and 23.7 percent of paperboard production was lost to Finland under the terms of the peace treaty.

As far as further actual supplies of wood pulp from Finland to this country are concerned, the Department of Commerce states that no information has been received to indicate a cessation of shipments but in February 1940, when shipments from other principal sources of supply were greatly increased, imports of all wood pulp from Finland were 20.9 percent less than for the corresponding period of 1939.

One other important factor concerning Finland is that exports of wood pulp to this country comprise only about 20 percent of Finland's total wood pulp exports and consequently any diminution of Finnish production is likely to cause a shortage of wood pulp in other countries besides the United States and thus curtail the available world supply.

Norway

The situation in Norway regarding wood pulp and paper is somewhat similar to that of Finland. Norway does not produce as large quantities as Finland, but Norway's production can be assumed to have been brought to a virtual standstill and will likely remain so for some while to come.

Norway's total exports of wood pulp approximate $30,000,000 in value while exports of newsprint total about $15,000,000. Together, these two items represent a sizeable value and quantity (approximately 750,000 tons woodpulp and 425,000 tons newsprint) the omission of which from the available world supply of these commodities will be appreciably felt. Furthermore, they are by no means reflected in the United States imports for 1939 when wood pulp from Norway was valued at $3,822,000 and newsprint at $1,473,000.

Sweden

Sweden, though still legally neutral, is so situated in the area of hostilities that the effect of war on the country's commerce is to reduce normal production and exports to marked degree. Exports in particular are suffering heavily, judged by diminishing shipments, as all available man power and industry is geared to armament and national defense.

As a result, it is anticipated that United States imports of Swedish wood pulp, amounting to $29,053,000 in 1939, will probably decline seriously or even cease entirely.

Altogether, Sweden exports wood pulp annually to a value exceeding $110,000,000 in addition to wrapping paper valued at about $25,000,000 and newsprint with miscellaneous papers worth more than $20,000,000.

Canada

For a number of years Canada has been the major foreign source of supply of wood pulp and newsprint for the United States. In 1937, Canada exported 870,000 tons of wood pulp of which the United States took 712,200 tons or over 80 percent valued at $33,033,000. The balance went principally to England and some to other countries. However, Canadian exports of newsprint totaled over three million tons valued in excess of $125,000,000 and of this the United States imported approximately 75 percent.

Summary

From the foregoing it will be seen that the pulp and paper industry, as far as production is concerned, involves principally Norway, Sweden, Finland, Canada, and the United States. Prior to the outbreak of war, Germany also was a source of paper base materials but due to the Allied blockade, no exports of this commodity have been made in recent months.

When it comes to consumption however, though the United States is by far the largest customer, both England and France, which produce very little pulp, are also relatively large consumers and therefore to arrive at a true perspective it is essential to view the situation internationally.

From that angle we find, based on 1937 figures which are the latest available for *all* countries, that from Germany, Finland, Norway and Sweden there is reduced or completely withdrawn from the *world* market, supplies of wood pulp aggregating 4,625,000 tons, 1,257,000 tons of newsprint, and 355,000 tons of wrapping paper. Against this England and France alone imported approximately 1,760,000

(*Continued on page* 68)

Four Month Period Shows Good Record

April Contracts High for Nine Years

SOUTHERN construction took a decided turn upward in April, when the total valuation placed on projects entering the contract stage mounted to $81,960,000, an April figure not equaled since 1931.

The first four months total of this year at $268,774,000 surpassed all similar periods within the past decade with exception of 1936 and 1939 and even compares favorably with the $280,565,000 figure for the first four months of second of these two peak years.

Encouraging gains occurred during April in almost all types of work, according to the tabulations which were compiled from the reports published in the CONSTRUCTION daily bulletin. The one exception, however, was in the industrial field, where the rate of awards fell to almost one-third of the five-month record set the month before. The April industrial figure was also below that for the same month of last year.

Both private building and road construction forged energetically forward during the month of April, the latter having a slight lead in the percentage gain. April's private building total of $19,844,000 was dominated by the $13,697,000 valuation set on Southern residential projects.

The $15,090,000 for highway construction was higher than it has been for nine months. Texas, Kentucky, North Carolina, Oklahoma, Louisiana and South Carolina led the procession in the order named.

Texas was at the head of all the Southern States from the viewpoint of valuation of contracts. The $20,115,000 valuation of awards in the Lone Star State, as listed in the CONSTRUCTION daily bulletin, was more than twice the $8,004,000 total of Maryland, the nearest competitor.

Among the South's outstanding industrial projects, both proposed and announced as reaching the contract stage in April, were:

A $350,000 paint plant at Houston, Tex., for the Pittsburgh Plate Glass Co.

A plant to be constructed at Baton Rouge, La., to produce Buna, a synthetic rubber substance for the Standard Oil Development Co.

Improvements costing $300,000 at the Norfolk, Va., generating plant of the Virginia Electric & Power Co.

An addition to the acetate yarn plant of the Tennessee Eastman Corp., at Kingsport, Tenn.

A proposition to establish an airplane manufacturing plant at Deland, Fla., made by the Babcock Aircraft Corp.

A $100,000 silo construction project at the Memphis, Tenn., plant of the Marquette Cement Manufacturing Co.

Work started on the $4,000,000 Mobile plant of the Alabama Power Co., as various material and erection contracts were announced.

Substructure work under way on the $4,000,000 Georgia Power Co., project at Macon, Ga.

A $3,000,000 expenditure for expanding the system of the Southern Natural Gas Co., Birmingham, Ala.

A $350,000 recycling operation in Henderson County, Texas, by Shamrock Oil & Gas Co.

A $1,000,000 addition to the Corpus Christi, Texas, plant of the Southern Alkali Corp.

An equipment installation at the plant of the Tennessee Coal, Iron & Railroad Co., Birmingham, Ala., to require 300 additional employes.

A $150,000 plant reconstruction project at Houston, Texas, for Liquid Carbonic Co.

The $1,350,000 construction program authorized for this year by Chesapeake & Potomac Telephone Co., Richmond, Va.

A $1,000,000 plant to be erected at Dallas, Texas, by Procter & Gamble Co.

Plans for extending Maryland facilties of Frankfort Distilleries, Inc., at a cost of $1,800,000.

Proposal to double capacity of recently completed $6,000,000 newsprint plant of Southland Mills, Inc., Lufkin, Tex.

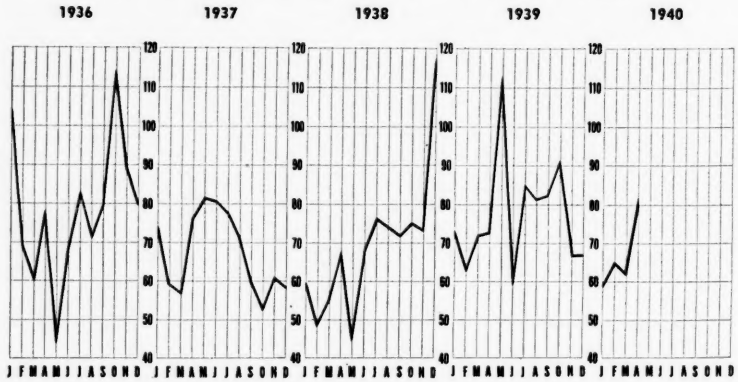
A $250,000 plant at Fort Worth, Texas for the Container Corporation of America.

Expenditure of $7,000,000 for expanding Amcelle, Md., and Celco, Va., plants of Celanese Corporation of America.

A $200,000 machinery installation in the spinning and carding department of the Courtney Manufacturing Co., Newry, S. C.

A $100,000 pipe coating plant at Houston, Texas, for the Industrial Engineering Co.

Southern Construction Trends by Months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Procter & Gamble Company's new $1,000,000 soap and soap products plant at Dallas, Texas, will look like the building shown in the perspective at top of page. To be built adjacent to an existing edible oil products plant, the main building of the new operation will be seven stories high, cover a ground area of 120 by 300 feet. It will be of heavy flat slab construction. Henry Manley, New York, is the architect. Engineering will be done by Procter & Gamble forces. H. K. Ferguson Co., Cleveland, received the contract.

An expansion program to cost $100,000 for the Fairmont (W. Va.) Coca Cola Bottling Works.

A $400,000 laboratory and office building at Charleston, W. Va., for the United Carbon Co.

Statistics of South's Construction

	April, 1940 Contracts Awarded	April, 1940 Contracts to be Awarded	Contracts Awarded First Four Months 1940	Contracts Awarded First Four Months 1939
PRIVATE CONSTRUCTION				
BUILDING				
Assembly (Churches, theatres, auditoriums, fraternal)	$2,751,000	$4,586,000	$5,921,000	$4,161,000
Commercial (Stores, restaurants, filling stations, garages, etc.)	2,795,000	3,714,000	10,065,000	8,964,000
Residential (Apartments, hotels, dwellings)	13,697,000	7,947,000	32,487,000	32,790,000
Office	601,000	2,295,000	2,207,000	10,901,000
	$19,844,000	$18,542,000	$50,680,000	$56,819,000
INDUSTRIAL	$8,723,000	$29,974,000	$61,801,000	$30,200,000
PUBLIC CONSTRUCTION				
BUILDING				
City, County, State, Federal	$6,381,000	$13,983,000	$29,441,000	$39,925,000
Housing	7,469,000	9,680,000	31,355,000	11,539,000
Schools	2,913,000	5,448,000	7,273,000	35,762,000
	$16,763,000	$29,111,000	$68,069,000	$87,226,000
ENGINEERING				
Dams, Drainage, Earthwork, Airports	$7,393,000	$4,000,000	$19,167,000	$23,805,000
Federal, County, Municipal Electric	13,422,000	12,194,000	20,442,000	22,997,000
Sewers and Waterworks	725,000	6,893,000	2,915,000	11,909,000
	$21,540,000	$23,087,000	$42,524,000	$58,711,000
ROADS, STREETS AND BRIDGES	$15,090,000	$13,848,000	$45,700,000	$47,609,000
TOTAL	$81,960,000	$114,562,000	$268,774,000	$280,565,000

Southern Construction

(By States)

	April, 1940 Contracts Awarded	April, 1940 Contracts to be Awarded	First Four Months 1940 Contracts Awarded
Alabama	$3,767,000	$2,910,000	$10,030,000
Arkansas	573,000	2,546,000	5,368,000
Dist. of Col.	7,637,000	3,282,000	17,926,000
Florida	5,664,000	23,963,000	28,375,000
Georgia	4,510,000	9,631,000	14,823,000
Kentucky	3,167,000	1,940,000	10,652,000
Louisiana	3,727,000	3,930,000	20,302,000
Maryland	8,004,000	5,040,000	21,416,000
Mississippi	921,000	3,506,000	8,998,000
Missouri	6,808,000	4,216,000	19,136,000
N. Carolina	3,105,000	3,735,000	7,874,000
Oklahoma	1,509,000	910,000	6,606,000
S. Carolina	2,273,000	5,351,000	6,665,000
Tennessee	4,856,000	9,374,000	19,819,000
Texas	20,115,000	22,374,000	49,692,000
Virginia	3,646,000	9,764,000	13,466,000
W. Virginia	1,678,000	2,090,000	7,626,000
TOTAL	$81,960,000	$114,562,000	$268,774,000

Industrial

(Industrial, Electric Railways, Railroads, Buses, Telephones, Docks, Steamships)

	April, 1940 Contracts Awarded	April, 1940 Contracts to be Awarded	First Four Months 1940 Contracts Awarded
Alabama	.....	$1,820,000	$2,560,000
Arkansas	$92,000	60,000	2,939,000
Dist. of Col.	.....	.....	329,000
Florida	204,000	1,100,000	5,803,000
Georgia	306,000	5,915,000	976,000
Kentucky	100,000	.....	2,650,000
Louisiana	1,155,000	870,000	3,474,000
Maryland	172,000	1,945,000	2,586,000
Mississippi	50,000	795,000	2,484,000
Missouri	1,105,000	259,000	1,802,000
N. Carolina	202,000	955,000	1,022,000
Oklahoma	99,000	205,000	3,127,000
S. Carolina	65,000	35,000	2,150,000
Tennessee	325,000	704,000	8,778,000
Texas	2,332,000	7,641,000	11,438,000
Virginia	2,206,000	7,325,000	4,722,000
W. Virginia	310,000	345,000	4,961,000
TOTAL	$8,723,000	$29,974,000	$61,801,000

Public Engineering

(Dams, Drainage, Earthwork, Airports; Rural, County, Municipal Electric; Sewers, Waterworks)

	April, 1940 Contracts Awarded	April, 1940 Contracts to be Awarded	First Four Months 1940 Contracts Awarded
Alabama	$106,000	.....	$1,109,000
Arkansas	20,000	$820,000	1,076,000
Dist. of Col.	3,126,000	250,000	3,298,000
Florida	391,000	2,588,000	784,000
Georgia	344,000	1,298,000	673,000
Kentucky	120,000	255,000	831,000
Louisiana	54,000	335,000	2,390,000
Maryland	15,000	.....	917,000
Mississippi	272,000	787,000	421,000
Missouri	2,828,000	1,817,000	8,670,000
N. Carolina	27,000	266,000	819,000
Oklahoma	.....	100,000	95,000
S. Carolina	661,000	4,651,000	1,026,000
Tennessee	3,337,000	2,905,000	4,972,000
Texas	9,333,000	6,457,000	13,336,000
Virginia	300,000	343,000	1,362,000
W. Virginia	606,000	215,000	745,000
TOTAL	$21,540,000	$23,087,000	$42,524,000

Private Building

(Assembly, Commercial, Residential, Office)

	April, 1940 Contracts Awarded	April, 1940 Contracts to be Awarded	First Four Months 1940 Contracts Awarded
Alabama	$130,000	$500,000	$517,000
Arkansas	75,000	470,000	220,000
Dist. of Col.	465,000	2,340,000	3,406,000
Florida	3,632,000	5,456,000	9,899,000
Georgia	1,290,000	1,125,000	3,328,000
Kentucky	.....	25,000	114,000
Louisiana	633,000	570,000	1,625,000
Maryland	4,303,000	742,000	9,055,000
Mississippi	214,000	167,000	915,000
Missouri	1,702,000	1,135,000	2,660,000
N. Carolina	515,000	754,000	1,293,000
Oklahoma	35,000	130,000	311,000
S. Carolina	186,000	190,000	969,000
Tennessee	310,000	100,000	1,304,000
Texas	5,578,000	3,283,000	12,611,000
Virginia	692,000	830,000	2,057,000
W. Virginia	84,000	725,000	396,000
TOTAL	$19,844,000	$18,542,000	$50,680,000

Public Building

(City, County, Federal; Housing; Schools)

	April, 1940 Contracts Awarded	April, 1940 Contracts to be Awarded	First Four Months 1940 Contracts Awarded
Alabama	$2,562,000	$155,000	$3,442,000
Arkansas	5,000	911,000	147,000
Dist. of Col.	3,687,000	420,000	9,918,000
Florida	1,337,000	9,228,000	8,925,000
Georgia	2,250,000	1,168,000	7,217,000
Kentucky	710,000	1,110,000	4,779,000
Louisiana	677,000	1,865,000	10,273,000
Maryland	3,150,000	1,273,000	7,061,000
Mississippi	63,000	1,182,000	1,167,000
Missouri	279,000	190,000	2,637,000
N. Carolina	375,000	850,000	1,456,000
Oklahoma	.....	60,000	445,000
S. Carolina	326,000	475,000	562,000
Tennessee	192,000	5.640,000	2,315,000
Texas	616,000	3,358,000	4,410,000
Virginia	232,000	1,116,000	2,965,000
W. Virginia	282,000	110,000	350,000
TOTAL	$16,763,000	$29,111,000	$68,069,000

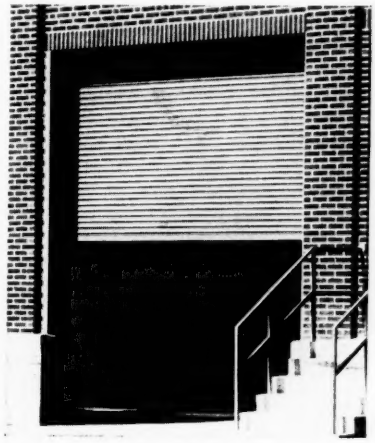
SPACE, TIME, MONEY!

YOU SAVE ALL THREE
with
KINNEAR ROLLING DOORS

Kinnear Rolling Doors save valuable floor and wall space by **coiling** out of the way above the opening.

They save **time,** by opening quickly, smoothly and easily all year long — snow, ice or swollen ground **can't** get in their way. They save **money,** too. Their rugged, durable, all-steel construction and interlocking-slat design mean longer lasting, **carefree** service. When opened, they **stay put** — out of the way, out of reach of damage by wind or vehicles. They will not sag, warp, split or pull apart. They give extra protection against fire, are weatherproof, and present an all steel barrier against thieves, intruders and rioters.

Moreover, every Kinnear Rolling Door is especially built to exactly fit the individual requirements. This reduces installation, operating and maintenance costs.



Kinnear Doors are built for any opening, in new or old buildings, with motor or manual control.

For all around door economy, you can depend on Kinnear's nationwide organization of specialists in door problems. Write for 1940 catalog today! The Kinnear Mfg. Co., 1600-20 Fields Ave., Columbus, Ohio.

KINNEAR
ROLLING DOORS

New Industrial Plants and Expansions in the South During April 1940

Ala., Anniston—Alabama Coca Cola Bottling Co.; garage addition
Ala., Birmingham—Republic Steel Corp.; iron ore plant
Ala., Birmingham—Southern Natural Gas Co.; expansion program — $3,000,000
Ala., Birmingham—Tennessee Coal, Iron & R. R. Co.; additional facilities
Ala., Florala—Wallis Tung Mill Co.; expeller storage plant — 25,000
Ala., Greenville—Greenville Ice Co.; plant
Ala., Headland—William L. Davis; cold storage plant
Ala., Lineville—Lineville Gin & Fertilizer Co.; feed crusher & grist mill
Ala., Mobile—Alabama Drydocks & Shipbuilding Co.; improvement program — 45,000
Ala., Mobile—Alabama Power Company; steam generating plant — 4,000,000
Ala., Mobile—Coffee Island Co., Inc.; cannery
Ala., Mobile—John Morrell Packing Co.; plant addition — 25,000
Ala., Opelika—Pepperell Mfg. Co.; addition
Ark., Calico Rock—J. A. Elder; saw mill
Ark., Conway—Swift & Company; ice cream plant
Ark., Searcy—Coca Cola Bottling Co.; plant remodeling, addition
Fla., Deland—Babcock Aircraft Corp.; factory and office
Fla., Jacksonville—National Container Corp.; box plant — 40,000
Fla., Miami—Dixie Tire Co.; building enlargement
Fla., Miami—Tropical Motors, Inc.; building improvement — 50,000
Fla., Miami—Charles T. Fuchs; bakery
Fla., Orlando—Monocoupe Aircraft Corp.; plant — 150,000
Ga., Albany—Atlantic Coast Line Railway; depot — 25,000
Ga., Atlanta—Atlanta Laundries, Inc.; plant
Ga., Atlanta—Henry Chanin Corp.; cotton waste plant
Ga., Atlanta—Seaboard Air Line Railway; freight warehouse
Ga., Augusta—Colonial Bakery Co.; building — 60,000
Ga., Columbus—Columbus Bottling Co.; plant
Ga., Columbus—Teche Greyhound Lines, Inc.; terminal
Ga., Dublin—Dublin Coca Cola Co.; bottling plant
Ga., Griffin—American Oil Company; service station
Ga., Savannah—Electric Ice & Fuel Co., Inc. of Georgia; building
Ga., Waynesboro—Waynesboro Coca Cola Bottling Co.; plant — 20,928
Ky., Louisville—Coca Cola Bottling Co.; plant
Ky., Louisville—Kentucky Macaroni Co.; plant — 75,000
Louisiana—Tennessee Gas & Transmission Co.; pipe line
Louisiana—United Gas Pipe Line Co.; gasoline plant
La., Baton Rouge—Standard Oil Development Co.; synthetic rubber plant
La., Mansfield—W. C. Nabors Co.; building
La., New Orleans—Jackson Brewing Company; building
Maryland—Frankfort Distilleries, Inc.; increased facilities — 1,800,000
Md., Baltimore—Charles M. Bandiere; garage
Md., Baltimore—Henry G. Connelly; service station
Md., Baltimore—Crown Cork & Seal Co.; addition
Md., Baltimore—P. Flanigan & Sons, Inc.; service station
Md., Baltimore—Sisson Realty Co., Inc.; factory
Md., Baltimore—Standard Metal Refining Co.; transformer station addition
Md., Baltimore—Sun Oil Company, service station
Md., Baltimore—Urban Laundry Co.; addition
Md., Cumberland—Celanese Corp. of America; extension program — 7,000,000
Md., Glyndon—John E. Scotten; mushroom plant — 12,000
Md., Hagerstown—Hagerstown Progress Corp.; building
Md., Sparrows Point—Bethlehem Steeel Co.; laboratory building
Miss., Hollandale—Merchants Company of Mississippi; grain elevator — 25,000
Miss., Jackson—Great Southern Box Co.; plant
Miss., Yazoo City—Pennebaker Dairyland; milk pasteurizing plant
Mo., Kansas City—Atchison, Topeka & Santa Fe R. R.; freight house remodeling
Mo., Kansas City—Kansas City Southern Railway; purchase of cars & locomotives — 1,112,000
Mo., St. Louis—Air Reduction Sales Co.; loading dock
Mo., St. Louis—Lucking Transfer Company; garage & office building — 25,000
Mo., St. Louis—Mines Equipment Co.; addition and alterations
Mo., St. Louis—Southern Equipment Company; plant — 50,000
Mo., St. Louis—Terminal Railroad Association; ten diesel engines — 700,000
N. C., Central Falls—Central Falls Mfg. Co.; installation of looms
N. C., Charlotte—Atlantic Greyhound Lines, Inc.; 40 buses
N. C., Charlotte—Carolina Chemical Company; plant
N. C., Charlotte—Carolina Transfer & Storage Co.; building and remodeling
N. C., Charlotte—Pepsi-Cola Bottling Co., Inc.; plant
N. C., Charlotte—Sandoz Chemical Works, Inc.; plant addition — 20,000
N. C., Charlotte—Wade Manufacturing Co., store fixtures
N. C., Durham—Clark and Sorrell; garage addition — 17,600
N. C., Greensboro—Standard Oil Co. of New Jersey; service station — 10,000
N. C., Henderson—Henderson Vulcanizing Co., plant addition
N. C., Lexington—Lexington Coca Cola Bottling Co.; plant
N. C., Shelby—Carnation Company; milk receiving plant
N. C., Shelby—Shelby Coca Cola Bottling Co.; plant
N. C., Sylva—Gulf Oil Corp.; building — 18,000
N. C., Thomasville—Carolina & Piedmont Coach Companies; bus terminal
N. C., Tuxedo—Green River Mills; addition
N. C., Wilmington—Gulf Oil Corporation; filling station
Oklahoma—Winkler & McQueen; refinery
Okla., Picher—Henry Craig; filling station
Okla., Tulsa—Franks Manufacturing Corp.; plant addition
Okla., Tulsa—Sand Springs Bottling Co.; plant remodeling — 15,000
Okla., Tulsa—Spring Service Co.; plant erection postponed
S. C., Greenville—Easterby Motor Company; building — 50,000
S. C., Greenville—Hartness Bottling Co.; plant — 23,239
S. C., Newry—Courtney Manufacturing Company; machinery installation — 200,000
Tenn., Carthage—W. H. Turner; locker plant
Tenn., Elizabethton—American Bemberg Company; plant improvements — 650,000
Tenn., Elizabethton—Coca Cola Company; bottling plant — 15,000
Tenn., Kingsport—Tennessee Eastman Corp.; rayon plant addition
Tenn., Maynardville—Southern Bell Telephone & Telegraph Co.; exchange & office
Tenn., Memphis—Federal Bake Shop; alterations and additions
Tenn., Memphis—Marquette Cement Mfg. Co.; two silos — 100,000
Tenn., Memphis—Southern Bell Telephone & Telegraph Co.; office
Tenn., Memphis—Walker & Son; filling station
Tenn., Nashville—Coca Cola Bottling Co.; plant
Tenn., Nashville—Southern Bell Telephone & Telegraph Co.; exchange — 14,000
Texas—American Oil Company; recycling plant expansion — 100,000
Texas—Magnolia Petroleum Company; plant
Texas—Shamrock Oil & Gas Company; development program — 350,000
Tex., Alice—Paul Prince Motor Sales Co.; auto sales room & service station
Tex., Austin—Austin Tribune; plant — 199,000
Tex., Beaumont—Gulf Glass Company; factory — 35,000
Tex., Big Spring—Marvin Wood; garage — 11,565
Tex., Brownsville—Davis & Co., Inc.; oil tank farm, refinery, shipping terminal
Tex., Corpus Christi—Southern Alkali Corp.; plant addition — 1,000,000
Tex., Corpus Christi—Texas Company; service station
Tex., Dallas—Procter & Gamble Co.; plant
Tex., Fort Worth—American Asphalt Roof Corp.; plant — 250,000
Tex., Fort Worth—Central Freight Lines; building remodeling — 20,000
Tex., Fort Worth—Container Corp. of America; box factory
Tex., Fort Worth—Container Corp. of America; paperboard plant — 250,000
Tex., Garrison—A. T. Mast & Associates; creosoting plant — 50,000
Tex., Houston—Houston Oil Field Material Co., Inc.; plant — 30,000
Tex., Houston—Industrial Engineering Co.; pipe coating plant — 100,000
Tex., Houston—Leonberger Mattress Co.; plant
Tex., Houston—Liquid Carbonic Company; plant — 150,000
Tex., Houston—Pittsburgh Plate Glass Company; paint plant — 350,000
Tex., Houston—Public Laundries; laundry — 10,000
Tex., Houston—Tokheim Oil Tank & Pump Co.; warehouse & office building — 13,500
Tex., Houston—Victor Vanden; service station, shop & apartment — 16,000
Tex., Houston—Young's Bakery; plant remodeling
Tex., Lufkin—Southland Mills, Inc.; plant expansion
Tex., Marshall—Marshall News-Messenger; plant — 20,000
Tex., Monahans—City (E. R. Hill, Mayor); sewage disposal plant, lift station, sewer & water lines — 45,114
Tex., Palestine—Texas Gulf Mining Co.; coal tar development
Tex., Sabinal—Mike Glasscock; filling station, cafe, kitchen & dining room
Tex., San Antonio—Continental Oil Co.; service station — 20,000
Tex., San Antonio—Ed Friedrich; plant addition — 40,000
Tex., San Antonio—Leroy Paul Linnartz; filling station
Tex., San Antonio—Longhorn Paint & Varnish Co.; equipment power installation
Tex., San Antonio—Magnolia Petroleum Co.; service station
Tex., San Antonio—Richter's Bakery; building
Tex., San Antonio—Swift & Company; office building, cooler addition, smoke house
Tex., Sherman—Grayson County Frozen Food & Locker Co.; locker plant — 23,500
Tex., Sherman—Interstate Cotton Oil Refining Co.; shop building & truck shed — 13,000
Tex., Trinity—W. B. Calvert; service station
Tex., Victoria—Daniel Boone Beverages, Inc.; bottling plant
Virginia—Chesapeake & Potomac Telephone Co. of Virginia; construction program — 1,350,000
Va., Luray—Luray Textile Co., Inc.; throwing plant
Va., Martinsville—Lester Lumber Company; airport
Va., Norfolk—Norfolk Southern R. R. Co.; purchase of railroad cars
Va., Norfolk—Virginia Ferry Company; improvements
Va., Norfolk—Virginian Railway; rebuilding steel & coal cars
Va., Pearisburg—Celanese Corporation of America; addition
Va., Petersburg—General Garment Mfg. Co.; plant — 12,000
Va., Pulaski—Rutherford Freight Lines; truck terminal — 15,000
Va., Richmond—Southern Biscuit Co.; addition — 250,000
W. Va., Charleston—United Carbon Co.; office & laboratory building — 400,000
W. Va., Fairmont—Fairmont Coca Cola Bottling Works, Inc.; expansion program — 100,000
W. Va., McMechen—Louis Marx & Company; building — 75,000
W. Va., Milton—Appalachian Electric Power Co.; substation
W. Va., Pineville—Appalachian Electric Power Co.; extension — 200,000
W. Va., Welch—B. & B. Laundry & Dry-Cleaning Co., Inc.; equipment installation — 20,000
W. Va., Wheeling—Telling Belle Vernon Co.; electrical installation — 10,000
South—Associated Gas & Electric System; construction program

National Metal Trade Convention

The 42nd annual convention of the National Metal Trades Association will be held at the Biltmore Hotel, New York, May 21-22. William Carson, president of the Sunbeam Electric Manufacturing Company, will speak on "Mutual Understanding—The Key to Sound Employer-Employe Relations," following which there will be other addresses and a panel discussion of important industrial relations subjects, led by six of the leaders in the metal trades industry. Various members will be asked to indicate their company's labor policy and explain the features that have made it successful.

The annual banquet will be held on the evening of May 21, featuring an address by Governor Raymond E. Baldwin of Connecticut.

B. & O. Railroad Report Marks Improvement

The annual report of President Willard of the Baltimore and Ohio Railroad giving operating results for 1939, shows a marked and encouraging contrast to the preceding year.

Total operating revenues grew to $161,030,252 as compared with $134,722,330 in the year preceding, or an increase of 19.53 per cent.

Net operating expenses, however, grew only 14.21 per cent, with a result that net operating revenue for 1939 of $41,129,177 was an increase of 38.30 per cent over 1938. Income available for fixed charges is $30,172,664 contrasted with $19,059,753 in 1938, or an increase of 58.31 per cent.

The Plan for the Modification of Interest Charges and Maturities announced August 15, 1938, was accepted by 87.79 per cent of owners of securities affected, and was approved by the District Court of the United States for Maryland on November 8, 1939. It permitted the extension of from five to ten years of $166,270,000 of maturities and fixed interest charges which had been $31,421,000 were modified so that $19,644,679 remains fixed and the payment of $11,376,435 for the period of eight years becomes contingent on earnings as ascertained and applicable pursuant to the Plan. The deferred charges continue as an obligation of the Company and are payable at or before the maturity of the respective obligations.

During 1939 total interest-bearing obligations were reduced by $6,654,249, largely through the payment of equipment trust certificates.

Grinnell Company Makes Fleming Sales Manager

Grinnell Company, Inc., Providence, Rhode Island, announces the appointment of James D. Fleming as Vice President and Sales Manager. Prior to this appointment, Mr. Fleming was Vice President and Manager of the Grinnell Company of the Pacific, a subsidiary. He will continue to manage the Pacific company but will be located at the company's home office at Providence.

One of Pennsylvania Central Airline's new 1940 Douglas airliners which will be put in service soon after June 1 between Washington, D. C., and Norfolk, Va.

"INSTALLED in Waukon, Iowa, February, 1933, a Sterling ten inch-19 stage deep well turbine pump has been in almost continuous operation, pumping from 45 to 60 million gallons of water annually," writes E. A. Nickelsen, Power Engineer, Interstate Power Co., Dubuque, Iowa.

"It has been giving excellent service as may be evidenced from the results of a recent efficiency test where it was found to have an efficiency of 68% and to deliver 300 G.P.M., against a total head of 338.9 feet with the use of 1.74 KWH per thousand gallons. That this is excellent performance, after nearly seven years of use, is quite evident, when it is considered that your sales representative only guaranteed 1.8 KWH per thousand gallons against the above head.

"More well-built and efficient equipment such as this," adds Mr. Nickelsen, "would certainly help eliminate erroneous ideas about power costs now caused by inefficient pumping units."

If you, too, want to lower pumping costs, write us about your pumping problems—today.

If you need service, Sterling gives it—*from coast to coast!*

STERLING PUMP CORP.

Hamilton, O.

Stockton, Cal.

New Ways of Doing Things

Paper-Insulated Cable

The development of a new type paper-insulated cable, for which a patent has been secured, is announced by Wylie Brown, President of the Phelps Dodge Copper Products Corporation, 40 Wall Street, New York City. Known as Habirshaw "Titebilt" Cable, the new product was developed in the research laboratories of the Corporation's new cable plant at Yonkers, N. Y. This cable, which is declared to be the latest development in the field of electrical power transmission, utilizes an improved insulation designed to give the oil-impregnated cable longer service life, higher impulse strength and better operating performance. Habirshaw "Titebilt" cables are made in both single and multi-conductor designs and in belted and shielded types.

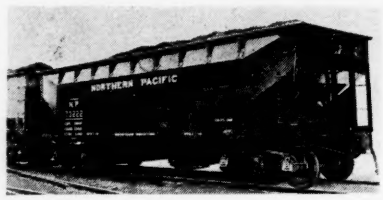
Heavy Duty Clutch Facings

The Gatke Corporation, Chicago, Ill., announces heavy duty clutch facings with integrally moulded gear teeth which eliminate the old method of assembling friction facings on metal backing plates. Teeth are moulded the full thickness of the facing, greatly increasing wear area and eliminating wear to the housing. Gatke moulded asbestos material combines great strength and heat conductivity with added advantages of long service life and powerful, but smooth, non-grabbing action at all operating temperatures. Teeth are moulded to accurate dimensions and faces are ground to close tolerances. All sizes are furnished up to 30 inches diameter.

Clutch Facings With Integrally Moulded Gear Teeth

Modern Hopper Cars

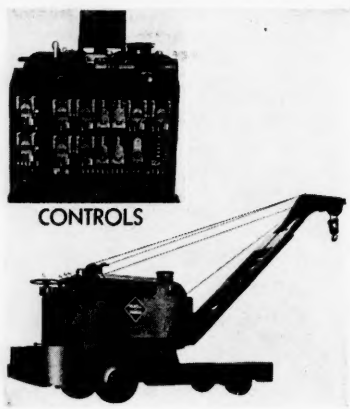
The American Car and Foundry Company, New York City, has just completed at its plant at Huntington, W. Va., and delivered an order for 200 fifty-ton hopper cars for the Northern Pacific Railroad. Weighing 41,000 pounds, which is a low weight for a hopper car, the new units were designed by American Car and Foundry Company and are built of low carbon open hearth steel. The car has a stenciled capacity of 100,000 pounds (50 tons), though actually 128,000 pounds (64 tons) may be loaded into the car without exceeding capacity of the four 5½ by 10-inch axles. This revenue load is 75.8 per cent of the maximum load on wheels. Ratio of payload to tare weight is 3.12 to 1, a high ratio for a carbon steel hopper car. Floor sheets, side sheets and other details in contact with the lading are of copper bearing steel, riveting being generally employed to fasten together the component parts of the car.



which follows generally the conventional riveted hopper car design except for I-beam body bolster design and fusion welded bolster center filler which is an a.c.f. development.

Streamlined Power Industrial Crane

With a rated capacity of 3,000 pounds at a 7-foot radius and travel speed up to 5½ miles per hour, depending upon battery voltage, a new streamlined power industrial crane, C-4, has been introduced by The Elwell-Parker Electric Company of Cleveland, Ohio. It is equipped with a standard telescoping boom, 12 to 19 feet, which slews approximately 300 degrees in 20 seconds, while the hook speed is 30 to 50 feet per minute. Power is optional—storage battery or gas electric. Four Elwell-Parker motors individually drive the travel, hook hoist, boom hoist and slew, all of which may be operated simultaneously if desired. Motors governing hook hoist, boom hoist and slew are directly accessible and are equipped with solenoid brakes. Cranes are fitted with full magnetic contractor control equipment, protected by a removable cover, while the four-wheel steering mechanism is of simple design, controlled with minimum effort from a horizontal wheel. The C-4 is built under the Underwriters' Laboratories' re-examination service.



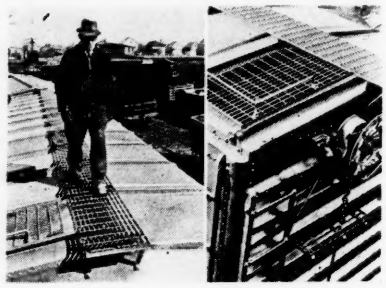
Elwell-Parker C-4 Industrial Crane

Electric Motor Control

Announcing their 540 line of D. C. Heavy Duty Contactors, Cutler-Hammer, Inc., Milwaukee, Wis., state that this is the latest addition to the Cutler-Hammer line of electric motor control and is available in 100, 150, 300, 600, 1200, and 1800 ampere sizes. The 540 line embodies two new achievements, it is declared, in the design and construction of contactors for heavy mill duty. A new, high efficiency type arc blow-out quickly drives the arc from the contacts to the large arc horns above the contacts. The instantaneous rupturing of the arc on the arc horns, instead of on the contacts, greatly prolongs contact life. The second achievement is the design and construction of the electric interlock.

Open-Mesh Steel Running Boards for Freight Cars

An accompanying illustration shows the first freight cars equipped with new open-mesh steel running boards and brake steps developed by Blaw-Knox Company, Pittsburgh, Pa. An adaptation of the company's electroforged grating, the new design has serrated bearing bars to improve its non-skid qualities. Its one-piece construction is declared to provide rigidity and freedom from rattling, while the absence of bolted joints reduces corrosion and wear.



Full-Rotation Box Grab and Tramrail Carrier

The Cleveland Tramrail Division of The Cleveland Crane and Engineering Company, Wickliffe, Ohio, has developed a full-rotation box grab and tramrail carrier suitable for conveying materials in a wide range of industries. By means of a gear motor drive, boxes may be turned to any position, and if desired a complete turn may be made. The grab is especially desirable where gradual dumping is desired. A twin hoisting unit is used for raising or lowering the box as wanted. Wood and steel boxes have been handled with equal success. The grab may also be used for handling crates or machinery, etc., turning or rolling them over, and is of great advantage for transporting boxes of materials from storage to mixing machines. In the latter connection, many boxes may be used with one Cleveland Tramrail grab and carrier. Grabs may be furnished for various sized boxes and loads up to 5 tons.

Effective May 1st on all transcontinental calls and most other calls over 420 miles

LONG DISTANCE rate reductions, effective May 1st, apply to all transcontinental calls and to most other calls of more than 420 airline miles.

For example, a 3-minute, station-to-station, daytime call between San Francisco and New York formerly cost $6.50. It now costs $4, and after 7 P. M., and all day Sunday, only $3.

The same kind of call between Minneapolis and New Orleans has been reduced from $3 to $2.50.

The new low rates bring distant friends or customers much nearer by telephone.

Just glance over the rate table at the right. Your Long Distance operator will be glad to give you the *new* rates to other far-away points.

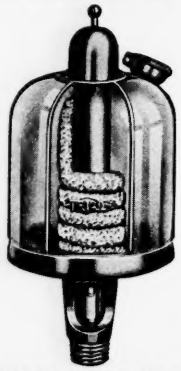
FROM	TO	3 MINUTES, DAY-TIME, STATION-TO-STATION★		3 MINUTES, DAY-TIME, PERSON-TO-PERSON★	
		OLD RATE	NEW RATE	OLD RATE	NEW RATE
San Francisco	New York	$6.50	$4.00	$8.75	$5.00
Philadelphia	Seattle	6.25	4.00	8.50	5.00
Salt Lake City	Washington, D. C.	5.00	3.50	6.75	4.50
Chicago	Los Angeles	4.75	3.50	6.25	4.50
Portland, Me.	Memphis	3.50	2.70	4.50	3.60
Miami	New York	3.25	2.50	4.25	3.35
Minneapolis	New Orleans	3.00	2.50	4.00	3.35
Dallas	St. Louis	1.70	1.55	2.25	2.05
Cleveland	Atlanta	1.65	1.55	2.20	2.05
New York	Detroit	1.55	1.50	2.05	2.00

★*Rates are lower still after 7 P. M. and all day Sunday.*

NEW WAYS OF DOING THINGS

Unbreakable Wick Feed Oilers

Intended for economical use on machinery which operates intermittently, a new, visible, unbreakable wick feed oiler is announced by the Trico Fuse Manufacturing Company, Milwaukee, Wis. A lever at the top, when in a vertical position, starts the feed and when "flipped" to the side shuts it off. There is no flooding and waste of oil when the machine is idle. The oil supply is always visible and

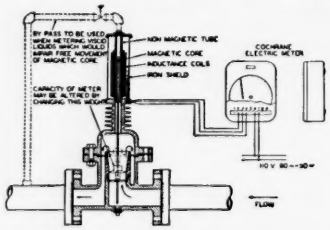


TRICO Wick Feed Oiler

the crystal clear unbreakable reservoir shows at a glance when refilling is necessary. When the oiler is filled above the point where the wick enters the center tube, the surplus oil drains into the bearings, thus flushing it thoroughly. When the oil recedes to the opening in the tube, the wick automatically feeds oil to the bearing by capillary action. Dirt or sediment cannot enter the bearing. The oiler is light in weight and all metal parts are bright cadimum-plated for beauty and easy cleaning. It is made in one, two, and four ounce capacities.

The Cochrane Linameter

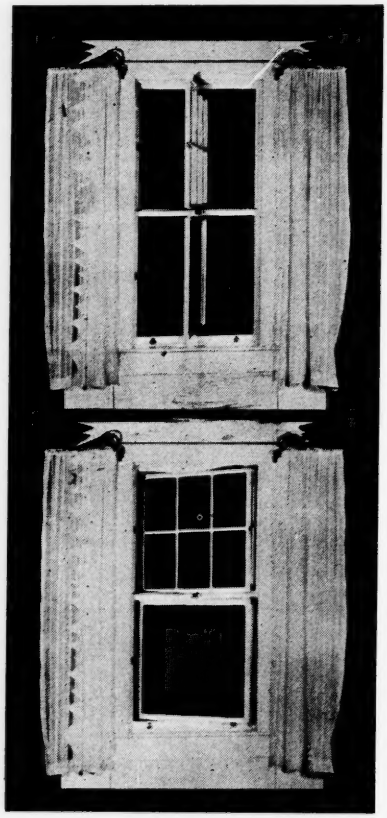
The Linameter, a new type of meter adapted particularly to the measurement of fluids having characteristics of viscosity, corrosiveness, and solubility such as fuel oil, ammonia, hot tar, etc., is announced by the Cochrane Corporation of Philadelphia, Pa. The new meter is of the area type, with meter body installed as an integral part of the pipe line and



containing a weighted disk positioned by the velocity of fluid through a tapered throat section in such a manner that the disk is directly proportional to flow rate. It is made in different combinations of indicating, recording and integrating features to suit particular conditions, and styles are available for wall, column or flush panel mounting.

Reversible Double-Hung Window

The Reversible Double-Hung Window Corporation, 103 Park Avenue, New York City, announces a recent development, for which patent is now pending, covering the design and construction of a reversible double-hung window which offers a number of important advantages. In addition to being the same as the old-fashioned window, it has a concealed window screen which makes its appearance only when the window is opened horizontally, although the window may be opened vertically as well as horizontally, permitting 100 per cent ventilation. The outside of the window may be washed inside the room, inasmuch as the window reverses itself into the inside of the room by the touch of a finger. A concealed window shade is not only preserved from discoloration and wear, but it does away with



the conspicuousness of showing a shade and is only visible when the shade is in use. Children may be safely left in the room with the window open, as the space made vacant by the opening is self-incased by the so-called concealed screen. The window is also declared to be burglar proof inasmuch as it may be left open during the night without fear of a burglar taking the window screen off and entering the room, since the screen is attached to and is a part of the window itself.

Other advantages claimed for the window are: it dispenses with risk insurance as it eliminates safety belt hooks, safety belts and the necessity of stepping outside of the window to clean it; the concealed window shade has greater durability; painters are able to work on the window inside the room simply by pivoting the inner sash 90 degrees, thus doing away with scaffolding on the outside; the glazier does not have to take the sashes apart to get to a broken window, as he merely reverses the outside of the window into the inside of the room; since the window carries a concealed window screen which makes its appearance only when the window is opened horizontally any necessary repairs may be easily made by removing the upper molding of the window and the window sill. A further advantage is that old windows may be modified to accommodate this new type. In accompanying illustrations, one shows both sashes of the window opened 90 degrees, thereby creating 100 per cent ventilation in the room, while the other shows both sashes open 180 degrees for the purpose of cleaning the outside of the window inside the room.

Pilot Plant For East Texas Iron Ore

(Continued from page 36)

area where vast deposits of the iron ore are to be found in about 25 counties, and where also, unlimited supplies of natural gas are easily available.

Meanwhile, company officials are engaged in making economic and marketing studies, preparatory to the operation of the commercial plant, and other such plants which are expected to follow if the process proves as successful under commercial operation as it has in previously held laboratory experiments.

The Texas corporation has obtained permits from the Securities Exchange Commission and from the Securities Division of the State of Texas, to issue its authorized capital stock of $250,000, and 20 per cent, or $50,000, has been paid in by the subscribing stockholders, principally East Texas business men.

The Texas Corporation, according to its prospectus, is the holder of an exclusive franchise to use in Texas, Oklahoma, Louisiana and Arkansas, the Madaras Process from the Madaras Corporation of Detroit, headed by Julius Madaras, the inventor and patentee of process.

Briefly described, the Madaras process involves the placing of crushed or fine ore into a pressure tank, whereupon the contents are subjected to hot compressed reducing gas which is released into the pressure tank in order to penetrate the pores and react with the ore, after which the used gas is exhausted and a new charge of fresh gas is introduced. This cycle of introduction and exhaustion of gas is repeated automatically every few seconds until the reduction of the ore is secured. This reduction process is carried on at comparatively low temperatures (about 1500 degrees, F.).

Officers of the Madaras Steel Corpora-

(Continued on page 69)

International Harvester's
FOUR NEW DIESEL POWER UNITS

Above: The big 6-cylinder International UD-18 Diesel—100 h.p. at 1,400 r.p.m.—is a real money maker, no matter how you figure. Other models are the UD-6, UD-9, and UD-14.

INTERNATIONAL HARVESTER scores another success in the Diesel field with FOUR NEW DIESEL POWER UNITS. Here is *smooth, economical* Diesel Power in *compact, convenient form—easily installed, simple to operate,* ready to solve your power problems and cut your power costs. These engines range in size up to the UD-18, rated 100 h.p. at 1,400 r.p.m.

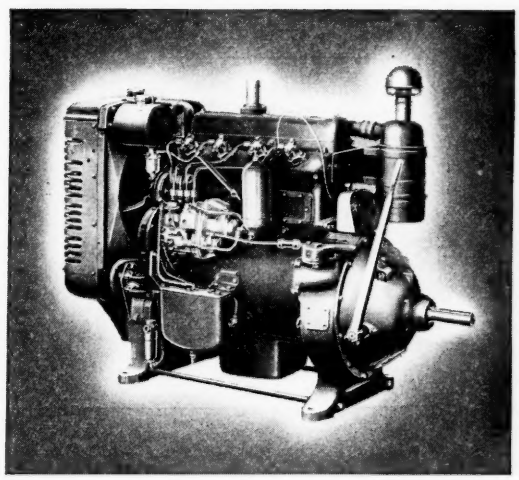
This good news for all users of power follows the introduction of International's FOUR Diesel TracTracTors for 1940. Now you can get International Diesel *design, quality, performance*—and International *full* DIESEL fuel economy—in *various sizes* of power units and crawler tractors.

International Diesels are engineered in every detail for *economy of operation, economy of maintenance,* and *long heavy-duty service.* See the nearby International industrial power dealer or Company branch for complete information. The International line also includes power units for gasoline, gas, and distillate operation.

INTERNATIONAL HARVESTER COMPANY
(INCORPORATED)
180 North Michigan Avenue Chicago, Illinois

FEATURE FACTS ABOUT INTERNATIONAL DIESELS

1. Full Diesel engine with full Diesel fuel economy.
2. Easy to install, simple to operate.
3. Basic parts can be attached or detached for a wide variety of equipment combinations.
4. Quick, easy starting.
5. Governor and extra-large flywheel maintain any engine speed desired, up to maximum governed r.p.m.
6. Long-lived, heat-treated alloy cylinders—replaceable.
7. Tocco-hardened crankshaft with precision-type, replaceable main and connecting-rod bearings.
8. Full-pressure lubrication thru drilled passages.
9. Completely sealed to keep oil in and dirt out.
10. Efficient cooling system with thermostatic by-pass control.

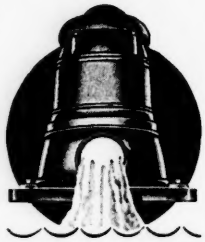


Above: Here is International Harvester's small Diesel, the UD-6 (shown equipped for indoor use). This 4-cylinder engine packs a lot of power and is built to stand up under severe operating conditions.

INTERNATIONAL Industrial Power

45,000 GALLONS DAILY

For the Cost of 3 Packs of Cigarettes



Forty-eight miles south of Memphis, for the Illinois Central System, a Layne Well Water System is pumping 45,000 gallons of water daily for the equivalent cost of three packs of cigarettes. Three years of continuous operation has brought no shut down for repairs; no expense of upkeep. This is typical of low cost operation and efficiency of Layne Well Water Systems.

Other Layne installations are providing up to 20,000,000 gallons of water daily at an even lower gallonage cost. Such performance is evident proof that years of experience and highest skill have combined to produce wells and pumps of outstanding quality and efficiency.

AFFILIATED COMPANIES

LAYNE-ARKANSAS CO. STUTTGART, ARK.
LAYNE-ATLANTIC CO. . . . NORFOLK, VA.
LAYNE-CENTRAL CO. . . MEMPHIS, TENN.
LAYNE-NORTHERN CO. . MISHAWAKA, IND.
LAYNE-LOUISIANA CO LAKE CHARLES, LA.
LAYNE-NEW YORK CO. . NEW YORK CITY. AND PITTSBURGH . . . . . PA.
LAYNE-NORTHWEST CO. MILWAUKEE, WIS.
LAYNE-OHIO CO. . . . COLUMBUS, OHIO
LAYNE-TEXAS CO. . . . HOUSTON AND DALLAS . . . . . TEXAS.
LAYNE-WESTERN CO., KANSAS CITY, MO. CHICAGO, ILL. . . . OMAHA, NEBRASKA
LAYNE-WESTERN CO. OF MINNESOTA MINNEAPOLIS . . . . . MINN.
LAYNE-BOWLER NEW ENGLAND COMPANY. BOSTON . . . . . MASSACHUSETTS.
INTERNATIONAL WATER SUPPLY, LTD., LONDON . . . . . ONTARIO, CANADA

Layne Well Water Systems are in use in all parts of the world. They are available in sizes to provide from a few thousand to many millions of gallons daily.

Any City, Factory, Paper Mill, Oil Industry, Railroad, Irrigation or business official may secure a complete file of bulletins, catalogs and folders on Layne Well Water Systems, without obligation, by addressing,

LAYNE & BOWLER, INC.
Dept. X-1, Memphis, Tenn.

LAYNE

PUMPS & WELL WATER SYSTEMS

For Municipalities, Industries, Railroads, Mines and Irrigation

FINANCE » » » and « « « INDUSTRY

What Debt Can Be Supported

The First National Bank of Boston in its monthly letter recently printed the following:

"The Federal debt is rapidly approaching the statutory limit of 45 billion dollars and considerable discussion is taking place concerning the debt capacity of the nation.

"The amount of debt a nation can support is determined by national income, present and prospective, as this is the source from which the bulk of tax revenue must come. The total cost of government of all political units in 1939 was in the neighborhood of 18 billion dollars, or the equivalent of more than 25 per cent of total national income for that year. In other words, if all governmental expenses were currently met, the American people on the average would work three months out of the year for the government. Instead of paying all the bills, the Federal government alone since 1930 has borrowed 27 billion dollars upon which interest must be paid. The interest charges on all Federal obligations now amount to more than a billion dollars a year and nearly approximate the total Federal debt of a quarter of a century ago.

"In 1913 Federal indebtedness constituted less than 21 per cent of the total debt of the country. It is now more than 68 per cent. This shows in a striking manner the great claims the Federal goverment has upon the income and the wealth of the country. In order to obtain revenue the Federal government has invaded many tax fields originally belonging to state and local governments. If this trend continues, local communities may find that they can not obtain sufficient funds to finance their regular activities. In such an event they would tend to become vassals of the central government.

"Total public debt—Federal, state and local—is approximately $2,000 for every family as against $269 per family in 1913. Whereas in the latter year public debt represented about 2.7 per cent of our wealth, it is now about 20 per cent. If private long-term obligations were added, our total debt burden would constitute 42 per cent of our wealth. Debt for the most part is a rigid structure whereas income flunctuates with the business tide. In conequence, the pressure bears down heavily in times of depression."

Reports Three Feet High

A private utility in referring to some of the uncontrollable increased operating expenses which are forced upon it, had a photograph made of reports filed in 1939 with state and national regulatory bodies. They made a pile three feet high, compared with a pile six inches high in 1933.

Residence Construction Increasing

The Department of Commerce in reporting a short time ago the total of all construction work in the United States for 1939 as a little less than $10,000,000,000, or 12 per cent higher than the year before, called attention to the rise in new residential construction. This was reported to have been nearly 40 per cent larger than in 1938. So-called public residential construction, that is under the program of the United States Housing Authority, accounted for a large part of the increase and in this field it is predicted there will be much further expansion in 1940.

(Continued on page 52)

NATURAL GAS

A fuel whose value has been proven by years of use in a most diversified line of industrial applications.

Natural gas has created the possibility of effortless comfort by the facility, and economy with which it fits into the home.

SOUTHERN NATURAL GAS COMPANY

Watts Building **Birmingham, Ala.**

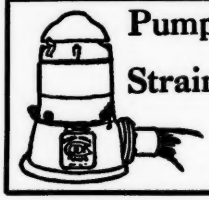
DRAWING MATERIALS

Drawing Instruments, Slide Rules, Planimeters, Drawing and Tracing Papers, Drafting Room Furniture, Surveying Instruments, Tapes.

PIGMENT Waterproof Drawing Ink

Catalogue sent on request.
Inquiries solicited.

F. WEBER CO. 227 PARK AVENUE
Est. 1853 BALTIMORE, MD.



Pumps—Deep-Well Plunger and Turbine
Strainers—and other well supplies
WATER PRESSURE SYSTEMS
A. D. COOK, Inc.
Lawrenceburg, Indiana

CREOSOTED TIES, PILING, POLES, POSTS, CROSS ARMS, and LUMBER

WOLMANIZED LUMBER—
Decay and Termite Proof—Can Be Painted
Docks for Ocean Vessels

American Creosote Works, Inc.
New Orleans, La.

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Norfolk, Virginia

Plants at: New Orleans; Winnfield, La.; Louisville, Miss. Savannah, Ga.; Jackson, Tenn., and Norfolk, Va.

Pensacola Invites Industry

Pensacola has what industry wants—good port facilities, marine terminals for the L & N R.R. and the Frisco Lines, nearby raw materials, good labor and living conditions, low costs of operation. Investigate Pensacola. For further information write
B. F. Langford, Sec. Mgr., Municipal Advertising Board—

PENSACOLA FLORIDA *on the Gulf*

We have helped

many businesses that have brought us their financial problems.

Correspondence invited.

BALTIMORE COMMERCIAL BANK
GWYNN CROWTHER, *President*
BALTIMORE, MARYLAND

Member Federal Reserve System
Member Federal Deposit Insurance Corporation

Today Myers brings you the most modern, the most dependable double acting cylinders on the market. There is nothing experimental about them. Designed by experts, built to precision standards, their reputation for dependable and economical service is firmly established in pump circles the country over.

Whether conditions are regular or otherwise, Myers Double Acting Cylinders satisfactorily solve most deep well pumping problems. They furnish the plus volume of water that lowers pumping costs and satisfies the most critical of users.

If you require more water from any source at lower cost than is possible to secure by ordinary methods write us for circular and complete information.

THE F.E.MYERS & BRO. CO.
ASHLAND, OHIO
PUMPS-WATER SYSTEMS-HAY TOOLS-DOOR HANGERS

Finance *and* Industry

(*Continued from page* 50)

Railroad Buying

J. J. Pelley, President Association of American Railroads, has called attention to the fact that the yearly average outlay of the country's railroads for new equipment and capital expenditures since 1931 has been $259,000,000. The yearly average from 1923 to 1930 was $843,000,000.

The situation, however, with regard to the railroads is improving. This is having the result of bringing them into the market as larger buyers than in recent years.

As indicating the improvement in railroad freight shipments, the following is cited: revenue freight for the week ending April 20 was 12.6 per cent above the corresponding week in 1939, and 20 per cent above the same week in 1938.

In purchases of material, fuel and supplies the total for 1939 was $769,314,000. This was an increase of $186,032,000 above 1938.

Excess Reserves

Excess reserve funds of member banks are now $6,100,000,000, which surpasses all previous records. The question is asked repeatedly what the Federal Reserve Board and individual banks are going to do with such a vast sum of credit money for which there is no present use. The banks naturally wish there was a call for it as it now earns no interest and the situation is not likely to improve until there is a greater demand for credit on the part of industry willing to venture and expand. How it will be handled when that time comes is important.

Inventories and New Business

The National Industrial Conference Board is authority for the statement that "The absence of further important accumulation since the end of January indicates that the inventory situation has been brought under control."

Inventories of manufactures in March remained at about the same level as in the preceding two months, while the rate of decline in new orders was sharply reduced.

The value of new business booked, according to the Board's seasonally adjusted index, was only 2 per cent less than in February as compared with a drop of about 10 per cent from January to February. The Board's index for March was back to the level of last August, having shown an uninterrupted decline since the high point established in September 1939.

Southern Railway Earnings

The net income of the Southern Railway in the first three months of this year was the largest for a long time with the exception of the first three months of 1937. In that year, while the gross revenues and freight loadings were on a higher level than in the first three months of 1940, the wage scale was on a lower level.

The first quarter net income this year, after deduction of all charges, was approximately $270,000, which is to be compared with a net loss of $253,000 for the first quarter of 1939.

A severe winter in the Southern states materially affected earnings this year. It was estimated they would have been three-quarters of a million dollars or more had it not been for unusual weather conditions.

When you are dissatisfied with your sales curve, do you wonder about the quality of your advertising copy? Do you demand ads with more punch? More *ump-ff?*

$ $ $ Your ads may be just right. There is such a thing as too much ump-ff. How about other phases of your advertising strategy?

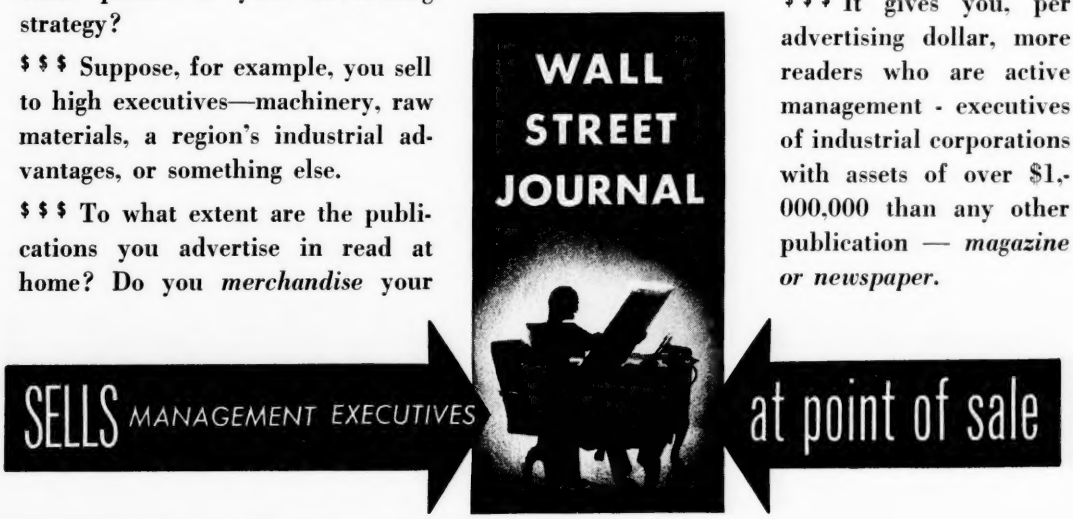
$ $ $ Suppose, for example, you sell to high executives—machinery, raw materials, a region's industrial advantages, or something else.

$ $ $ To what extent are the publications you advertise in read at home? Do you *merchandise* your story forcefully enough *in offices*, where executives can readily consult with associates, dictate instructions, get further facts, and *buy?* If you don't, you can't expect full value from your advertising copy.

$ $ $ You merchandise your advertising, you tell your story to management executives at *point of sale*, by using The Wall Street Journal. It is the one and only national publication for that purpose.

$ $ $ 86 per cent of its subscribers read it in their offices at their desks.

$ $ $ It gives you, per advertising dollar, more readers who are active management - executives of industrial corporations with assets of over $1,000,000 than any other publication — *magazine or newspaper.*



INDUSTRIAL NEWS

Yale and Towne Promote Morgan

James C. Morgan, formerly General Sales Manager of the Philadelphia Division of The Yale & Towne Manufacturing Company, Stamford, Conn., has been promoted to the position of General Manager of the entire Philadelphia plant. Mr. Morgan first joined Yale and Towne in 1920 when he went to Stamford from C. B. Hunt Company to take charge of Yale's Electric Truck sales. Sales increased to such an extent that the electric truck and hoist divisions were combined into one unit under his supervision. It was in this position that Mr. Morgan laid the groundwork for manufacturing and sales methods that have made Yale and Towne one of the largest manufacturers of materials handling equipment. As is well known, this company also makes the famous Yale locks, hardware, etc.

Transfers From Houston to New Orleans

Manning, Maxwell and Moore, Inc., Bridgeport, Connecticut, manufacturers of valves, gauges, safety valves, thermometers and control instruments, announce the transfer of R. F. Heath from the Houston territory to the New Orleans territory which was formerly covered by Jack Schuyler. Mr. Heath has many friends in the New Orleans district where he was located before taking over the Houston territory.

"Caterpillar" Display at Petroleum Exposition

The Caterpillar Tractor Company, Peoria, Ill., plans to have a complete line of power for oil field service on display with its exhibit at the Eleventh International Petroleum Exposition in Tulsa, Oklahoma, May 18-25. Occupying spaces C and E, "Caterpillar" will show its entire line of Diesel oilfield engines, ranging from 32 to 180 horsepower. In addition, a single-cylinder, 5.5 horsepower, spark-ignition pumping engine and a 135-horsepower, Diesel marine engine will be shown. Featured in this display will be the "Caterpillar" crude oil fuel system, shown on a 132-horsepower, six-cylinder engine, while a similar unit will be equipped with the company's attachment for burning natural gas. The track-type tratcor exhibit will feature two of the new "Caterpillar" D7, 75-horsepower Diesel tractors—one equipped with a LeTourneau cable-controlled bulldozer, and the other with a LaPlant-Choate hydraulically operated 'dozer. A Hyster winch will be mounted on one of the machines. In addition to the LeTourneau, LaPlant-Choate and Hyster companies cooperating in the display, other manufacturers will show their products teamed with, or mounted on, "Caterpillar" track-type tractors. The "Caterpillar" display will be in charge of Robert Culshaw, with many other company officials and representatives in attendance. Company headquarters will be at the Mayo Hotel.

THE BALTIMORE & OHIO RAILROAD COMPANY

SUMMARY OF ANNUAL REPORT FOR YEAR 1939

The Company's annual report of its operations and affairs for the Year 1939 is being mailed to stockholders. The following presents a

CONDENSED COMPARATIVE STATEMENT OF OPERATING RESULTS

	1939	1938	Increase 1939 Over 1938 Amount	%
Total Railway Operating Revenues	$161,030,252	$134,722,330	$26,307,922	19.53
Total Railway Operating Expenses	119,901,075	104,984,021	14,917,054	14.21
Net Railway Operating Revenue	$ 41,129,177	$ 29,738,309	$11,390,868	38.30
Railway Tax Accruals	$ 10,767,991	$ 10,412,774	$ 355,217	3.41
Equipment and Joint Facility Rents	4,836,085	4,473,741	362,345	8.10
Net Railway Operating Income	$ 25,525,100	$ 14,851,794	$10,673,306	71.87
Income from Investments, etc. (Net)	4,647,564	4,207,959	439,605	10.45
Income available for Fixed Charges	$ 30,172,664	$ 19,059,753	$11,112,911	58.31
Interest and other charges remaining Fixed under the Plan (referred to below)	20,421,656	32,184,283		
Income Available for Other Purposes	$ 9,751,008			
Other Interest Accrued but not paid—				
Secured Contingent Interest	$ 7,111,820			
Unsecured Contingent Interest	$ 4,261,395			
Total Contingent Interest Accrued	$ 11,373,215			
Net amount by which total interest charges were not earned	$ 1,622,207	$ 13,124,530		

Net Income Available for Interest and Other Charges for 1939 is $30,172,664, compared with $19,059,753 for 1938, an increase of $11,112,911 or 58.31 per cent., and shows income for the year only $1,622,207 short of covering entire interest charges. From the Net Income Available there was deducted $20,421,656 for interest and other charges remaining fixed under the Plan, leaving Available Net Income for other purposes of $9,751,008.

Pursuant to the provisions of the Plan, the President and Board of Directors, in the exercise of the discretion vested in them, determined to apply $2,000,000 of the Available Net Income to Capital Fund, and the remaining $7,751,008 to increase Net Working Capital. By reason of these appropriations, no contingent interest is payable on May 1, 1940, out of the income of 1939.

The contingent interest accrued in 1939 and not paid is $11,373,215, and that for 1938 $883,337, a total of $12,256,552, which is carried to Deferred Liabilities in the balance sheet.

The Plan herein referred to is that for the Modification of Interest Charges and Maturities, dated August 15, 1938, which, after being accepted by the holders of $476,489,928, or 87.79 per cent. of the $542,810,628 of securities affected, was submitted to and, after hearing, was approved by the District Court of the United States for the District of Maryland on November 8, 1939, acting under Chapter XV of the Bankruptcy Act, entitled "Railroad Adjustments."

Under the Plan $166,270,421 of near-by maturities were extended for a period of from five to ten years, and fixed interest charges of the Company and its subsidiaries, which had been $31,421,742, were modified so that $19,644,679 remains fixed and the payment of $11,376,435, for the period of eight years, becomes contingent on earnings as ascertained and applicable pursuant to the Plan. The deferred charges continue as an obligation of the Company and are payable at or before the maturity of the respective obligations.

During 1939 the total interest-bearing obligations of the Company were reduced by $6,654,249, largely through the payment of equipment trust certificates.

DANIEL WILLARD, *President*

Johns-Manville Report

Consolidated net profit of the Johns-Manville Corporation, New York City, for 1939, amounted to $4,164,718, according to the corporation's annual report. After allowing $525,000 or $7.00 per share in dividends for holders of 75,000 shares of preferred stock, the net profit was equivalent to $4.28 a share on 850,000 shares of common stock outstanding at the end of the year. Net profit in 1939 compared with $1,455,302 in 1938, which was equivalent, after preferred dividends, to $1.09 a share on the same number of shares of common stock. Dividends of $2.75 per share were paid in 1939 on the 850,000 shares of common stock, aggregating $2,337,500, as compared to $425,000 or $.50 per share in 1938.

Morrison Products, Incorporated

Effective May 1, 1940, the name of The Metal Stamping and Manufacturing Company, 16816 Waterloo Road, Cleveland, Ohio, was changed to Morrison Products, Inc. There has been no change in the stockholders, directors or personnel—simply a change in name to one that is more distinctive, easier to remember and better adapted to describing the company's manufacturing facilities and products. In addition to stampings and assemblies to customers' specifications, the company also manufactures and sells under its own name "Airstream" Blowers for the air conditioning industry; drawn steel guards for portable tools and bench grinders; drawn steel pulleys for V-belt drives, and automobile replacement parts. Hunter Morrison is the president and general manager.

A. W. Limont, Jr. With Struthers-Wells

Struthers-Wells Company, Warren, Pa., announces the affiliation of A. W. Limont, Jr., with their Titusville (Pa.) Processing Equipment Division. Mr. Limont, a mechanical engineering graduate of Cornell University, was connected for many years with E. I. du Pont de Nemours & Company, specializing in mechanical plant equipment and as project engineer on chemical plant design. Forced to increase manufacturing and engineering facilities by reason of expanding business, Struthers-Wells now manufacture certain types of equipment at their Titusville plant, including high pressure autoclaves, evaporators, dryers and kilns. Mixing equipment, heat exchangers, pressure vessels, distillation and extraction units, and other types of stainless and corrosion-resistant equipment are produced at the Warren plant.

Pillsbury Receives Pioneer Award

Edwin S. Pillsbury, president of Century Electric Company, St. Louis, Mo., was honored recently by an award for outstanding contribtuions to industrial progress through invention and research. The award was given by the Committee on Modern Pioneer Awards and the occasion was the celebration of the 150th anniversary of the American Patent System. Mr. Pillsbury's award was given for his pioneering in the electric motor field.

Meyer Represents Cutler-Hammer at Houston

G. E. Booth, manager of the St. Louis district office of Cutler-Hammer, Inc., Milwaukee, Wis., manufacturers of electric switches and motor control, announces that E. F. Meyer is now in charge of the company's Houston territory with headquarters in that city. Graduating in Electrical Engineering from the University of Wisconsin, Mr. Meyer soon joined Cutler-Hammer, beginning his career in the experimental and testing departments of the main plant in Milwaukee. After becoming acquainted with the design, construction and application of C-H electrical equipment, he joined the staff of the Milwaukee District Sales Office as a sales engineer, and from there went to the St. Louis territory.

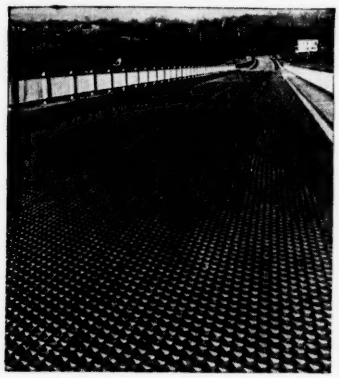
Hercules Powder Report

For the first quarter of 1940, net earnings of Hercules Powder Company, Wilmington, Del., amounted to $1,742,573 after providing for depreciation and Federal taxes. After payment of preferred dividends, this is equal to $1.22 a share on an average of 1,316,710 shares of common stock outstanding during the quarter. It compares with 73 cents a share for the first quarter of 1939.

N. A. Strand

N. A. Strand & Company, Chicago, Ill., manufacturers of flexible shafts and machines, announce the death at his home in Evanston, Ill., on April 10, of N. A. Strand, a partner in the firm. Mr. Strand's death occurred after a long illness which necessitated his retirement from active business several years ago.

NOT A PENNY for MAINTENANCE



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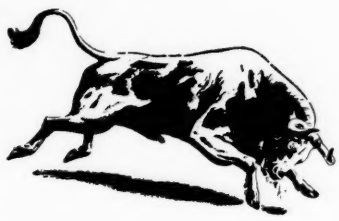
Send for sample pages

POOR'S PUBLISHING CO.
90 Broad Street, New York

From tough steer– *to* TENDER STEAK

by Westinghouse



• *When a friend* unexpectedly happens to drop in for dinner, it's no more than right that he take pot-luck for granted. But when we carefully plan a dinner, long in advance, most of us pretty much stick to the rule of serving the best food we can get.

• *That rule* was rudely broken last April, when one hundred and forty-six people sat down to dinner at a Cleveland hotel. It was a notable group—civic and industrial leaders, food experts, home economists, chefs, editors—people invited for one particular purpose, to taste a new kind of steak.

• *They were not served* choice beef; those steaks were not expensive. Average in quality, average in price, average in every respect—but one! This beef was treated by a new process, called Tenderay, which has the peculiar ability of making ordinary beef as tender and juicy in just three days as the expensive cuts the very finest hotels serve after three or four or five weeks' aging.

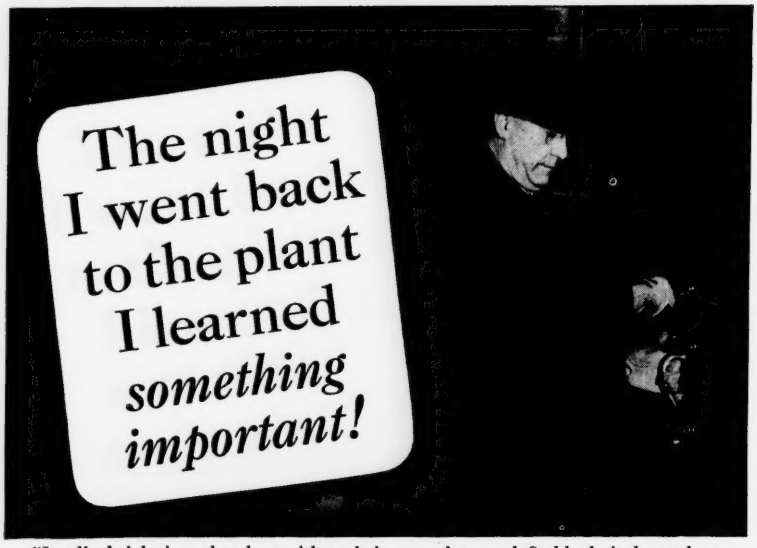
• *The guests were delighted.* The steaks, they said, were excellent. But they were not half as pleased as Mrs. Cleveland housewife who learned that from that day on she could buy the same kind of beef at her own store. Heard that for the first time she could buy steak without guess and without gamble and know that it would be tender—always.

• *The Tenderay process,* developed by Westinghouse in cooperation with the Kroger Food Foundation and Mellon Institute, depends on a lot of factors; humidity, temperature and what not. BUT—and here is where Westinghouse research plays such an important part—the process would be utterly impractical without the newly perfected *Sterilamp which kills bacteria with light and keeps the meat fresh and sweet.

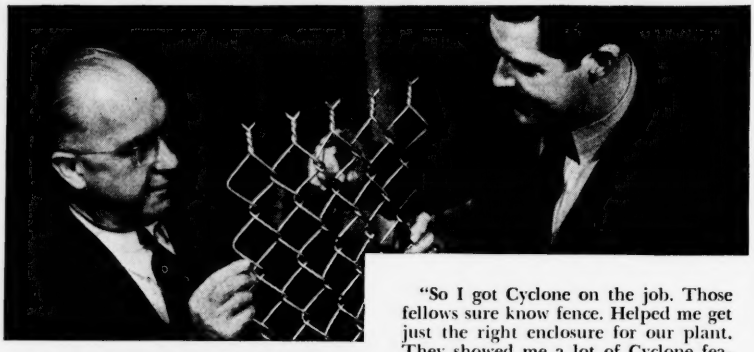
• *He would be a* rash prophet who'd care to predict the uses commerce and industry and medicine will find for the Sterilamp. A poultry man says it solves his turkey raising problems. Restaurants, hotels, bars and soda-fountains—in ever increasing numbers—depend on Sterilamps to keep glasses sterile; meat markets and groceries to keep food fresh, to reduce spoilage and refrigeration costs. One of the country's largest hospitals has installed Sterilamps to sterilize the air in the operating rooms. Another in the nursery to protect babies in their cribs.

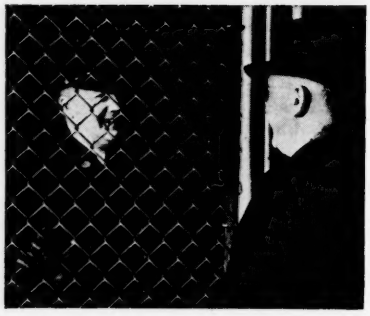
• *Certainly Westinghouse,* when this development started, did not know its ultimate scope. And that, after all, is the way of research and its great justification. It is an exploration into the unknown, it follows new paths and uncharted byways—not with the assurance of success; merely with courage and experience and knowledge, and sound common sense as a guide.

*REG. U. S. PAT. OFF.



"I walked right into the plant without being seen by a soul. Suddenly it dawned on me that any one else could do the same—a burglar or a fire-bug. That experience made me realize we needed better plant protection.





"So I got Cyclone on the job. Those fellows sure know fence. Helped me get just the right enclosure for our plant. They showed me a lot of Cyclone features I could see were worth while. And their price was right, too.

"Well—that's off my mind. Now we don't have to trust to luck. With a watchman at the gate, we know who comes in or goes out, day or night. Any plant manager who wants to take a load of worry off his mind ought to call in Cyclone. Mail the coupon. Cyclone's advice and estimate won't cost anything."

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The Emerson Electric Manufacturing Company, St. Louis, Mo.

STOKERS—
Catalog—"Detroit UniStoker," illustrating and describing the Detroit UniStoker and showing some outstanding installations.
Detroit Stoker Company, General Motors Building, Detroit, Mich.

ACCIDENT PREVENTION—
Catalog 40—illustrating and describing equipment for the prevention of accidents in industry.
The Boyer-Campbell Company, 6540 Antoine Street, Detroit, Mich.

FLANGING AND PRESSING—
Catalog No. 1—"Lukens Flanging and Pressing," declared to be the most comprehensive publication ever issued on the subject of spun heads for boilers, tanks, pressure vessels and for other uses; 132-page manual presenting considerable data never before published, offering the equipment designer and fabricator every major item of information essential to the calculation of prices for forming spun heads; prefaced by a history of machine-spinning covering a 55-year period.
Lukens Steel Company, Coatesville, Pa.

REFLECTORS—
Folder—illustrating and describing Nos. 645 and 645-AL Lobay Reflectors for use with 400 watt Mercury Vapor lamp, the unit being applied where higher light intensities are required and where the available wattage is limited; No. 645 is especially recommended for lighting in the metal industries, No. 645-AL when used with aluminum cover.
Holophane Co., Inc., 342 Madison Avenue, New York, N. Y.

LOW-PRESSURE GATE VALVES—
Bulletin No. 808—illustrating and describing low-pressure all-iron gate valves for water gas, coke oven, chemical and power plants and other industrial applications; table gives complete specifications of valves from 4 inches to 48 inches in size; details of construction and operation are shown; valves equipped with bevel and spur gears, chains, hand wheels, dust shields and indicators.
Koppers Company, Bartlett Hayward Division, Baltimore, Md.

CENTURY ELECTRIC REPORT—
Booklet—simplified and understandable report in balance sheet form, explaining each item under current assets and current liabilities; also presents profit and loss statement in which each item is explained in simple terms; publication was distributed to stockholders of the company as an excellent example of what can be done to remove the mystery from the ordinary profit and loss statement and balance sheet.
Century Electric Company, St. Louis, Mo.

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Caterpillar Tractor Company, Peoria, Ill.

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Booklet—illustrating and discribing Republic Double Strength Steel which is declared to reduce dead weight, fabrication costs, and corrosion loss.
Republic Steel Corporation, Alloy Steel Division, Massillon, Ohio, general Cleveland, Ohio.

LEWIS IRON—
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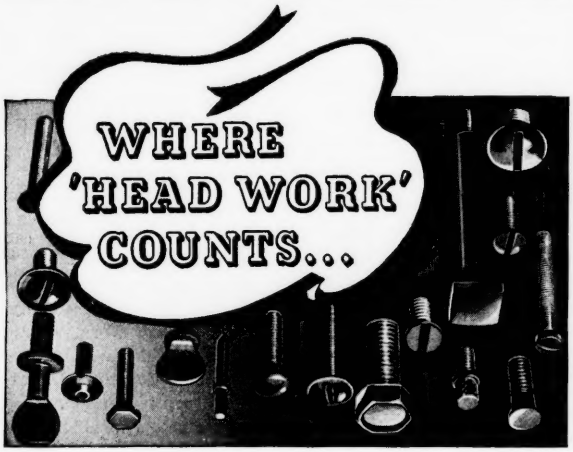

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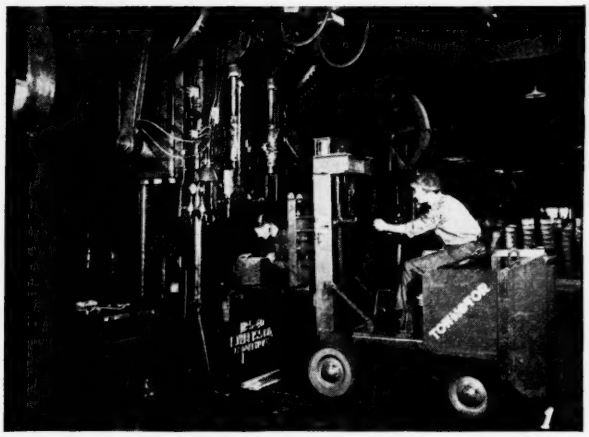
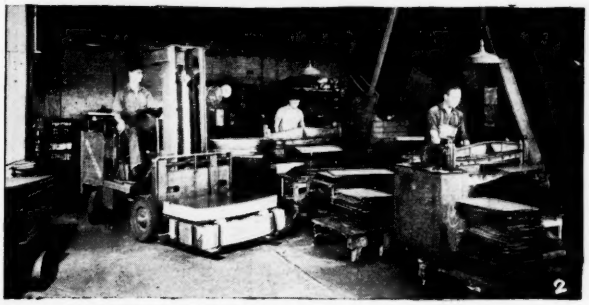
FACTS

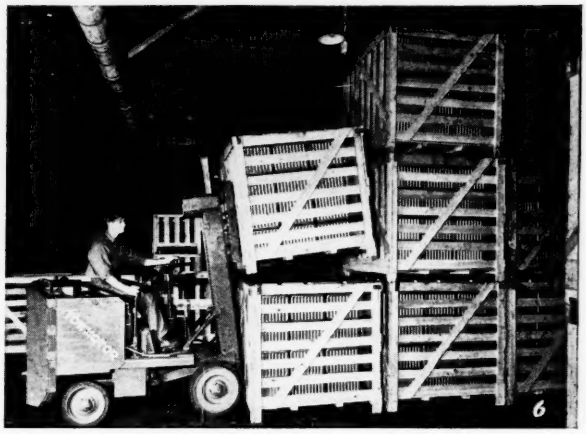
One TOWMOTOR user reports reducing handling costs from 28c per ton to 9c per ton. Another user reports handling costs reduced from 17c per ton to 4c per ton. What other plants have saved, you too, can save with TOWMOTORS.



Moving dies to and from die rack to presses in a stamping plant.



Bringing steel sheets from storage to shearing machines.



Stacking crates of finished product in warehouse.

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Wharton L. Peters, St. Louis Mart Bldg., St. Louis, Mo. Phone: GA. 3050

James J. Alvarez, Merchants Nat. Bank Bldg., Mobile, Alabama. Phone: DExter 5882

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TOWMOTOR CO. 1237 E. 152nd St., Cleveland, Ohio

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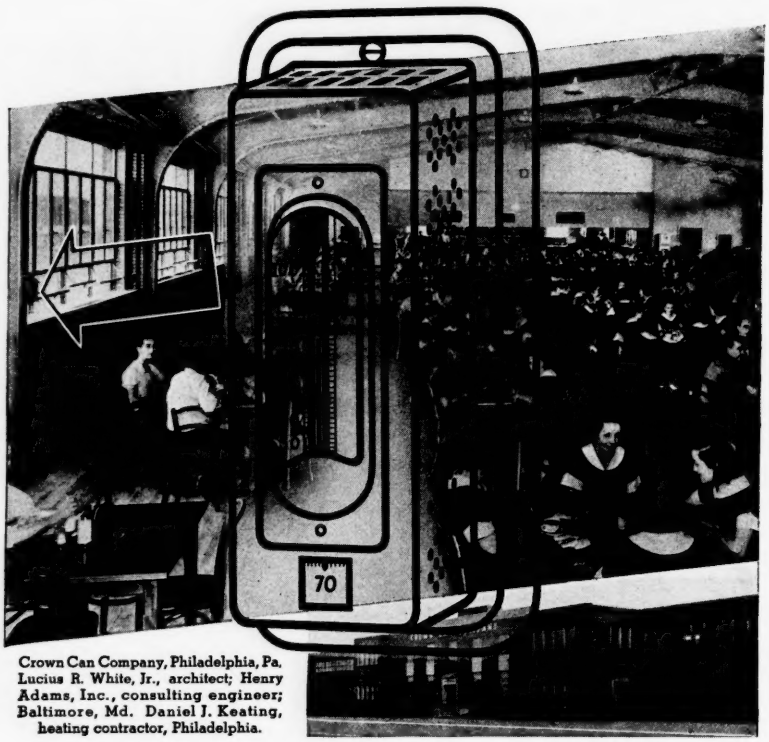

Crown Can Company, Philadelphia, Pa. Lucius R. White, Jr., architect; Henry Adams, Inc., consulting engineer; Baltimore, Md. Daniel J. Keating, heating contractor, Philadelphia.

This Philadelphia manufacturer, like other progressive producers, considers the comfort and health of employees as an important contribution to operating efficiency. Here at Crown Can, the office and cafeteria sections of the plant are equipped with JOHNSON Automatic Temperature Control, involving more than 60 room thermostats to operate radiator valves and also dampers and valves in unit ventilating machines . . . Whatever or wherever the problem in temperature, humidity and air conditioning control, the nation-wide Johnson organization is nearby, at your service with its broad experience of more than half a century.

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JOHNSON SERVICE COMPANY: MILWAUKEE, WIS. AND DIRECT BRANCHES IN PRINCIPAL CITIES

Alabama State Docks Expands Bulkhandling Plant

(*Continued from page* 34)

shed, a pivoted sopper is so arranged as to deliver the material to conveyor carrying to an elevated bin. From the bin, the material is delivered by a short feeder through a pivoted weightometer via chutes to cars.

From storage to sacking bins the material is loaded by a 5/8 cubic yard Bay City electric shovel located in the building to a portable conveyor, which elevates it to another conveyor running along the side of the building under the platform cover which carries it to still other conveyors at the south end of the buiding, and in turn elevate it to Jeffrey screens in an enclosed tower. From the screens it drops to bins equipped with Richardson automatic weighing and sacking heads from whence a shuttle conveyor carries it through Union Sewing machines to the cars. There are two sacking and weighing machines with sewing heads each of 14 sacks 100 lbs. per minute capacity. The oversize material from the screens is carried to a crusher and from there returned to screens. The railroad cars are spotted for loading by a car haul with controls located in the bagging plant.

From storage to carloading bin the material is loaded out with shovel and portable conveyor to the conveyor along the side of the building, which conveyor serves the sacking bins but is now reversed in direction and carries the material to the five way tower and thence to carloading bin.

All electrical equipment is General Electric weather-proof and dust-proof with explosion-proof motors.

The plant is also provided with two Stephens-Adamson portable box car loaders.

The contractor for building the conveyors and bagging equipment was the Rust Engineering Co., of Birmingham, while Hancock Co., of Mobile, installed the paving and trackwork and L. L. Jarrell, the water and fire protection.

C. E. Sauls is director of the port: C. U. Irvine is operating assistant.

The project had a PWA grant and the resident engineer inspector was H. A. Lindstrom.

J. B. Converse & Co., Inc., Engineers, Mobile, Ala., prepared designs, plans, specifications and supervised construction.

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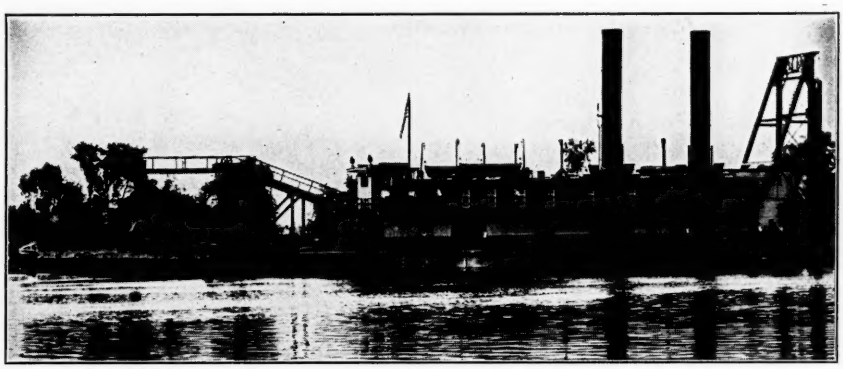

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NEW YORK: 15 Park Row HOUSTON, TEXAS: Scanlan Building

77 New Industries Located On N. & W. Territory

(*Continued from page 37*)

processes and new products, is increasing the importance of the natural resources in territory served by the Norfolk and Western Railway Company, and raw materials found in abundance in our territory that have hitherto been considered of minor value, are assuming more importance as they enter into newly developed chemical products.

"In the textile industry there is still a considerable demand for locations for industries manufacturing products made from rayon, and the possible location of other plants manufacturing cellulose raw materials.

"The industrial production of the country enters the new year on a level above that of the average for the first half of 1939. The present levels are sufficiently high and existing orders so considerable that trade and industry may confidently look forward to at least a good first quarter. Another reason for encouragement is that the recent advances in general business activity have been mostly due to increases in the production of durable goods.

"From our observations, however, and the results of our activities during 1939 in the location and expansion of industry in our territory, we believe that such a condition as above recited would have the effect of increasing demands for more economic manufacturing locations, and would more or less redound to the benefit of territory served by the Norfolk and Western Railway."

Plants and additions established by states in 1939 were: Virginia, 110; Ohio, 61; North Carolina, 14; West Virginia, 13; and Maryland, 1.

Of the new industries located on the Norfolk and Western, 17 were manufacturers of food and kindred products; eight petroleum distributors; five textile manufactories; eight stone, clay and glass manufactories; six mines and quarries; six iron and steel plants; five manufactories of forest products; four chemical and allied products plants; three paper and paper products plants, and 15 miscellaneous industries.

Textile manufacturers were the most numerous in additions to established industries on the Norfolk and Western with 17, while 11 manufactories of food and kindred products and 11 iron and steel plants also made additions.

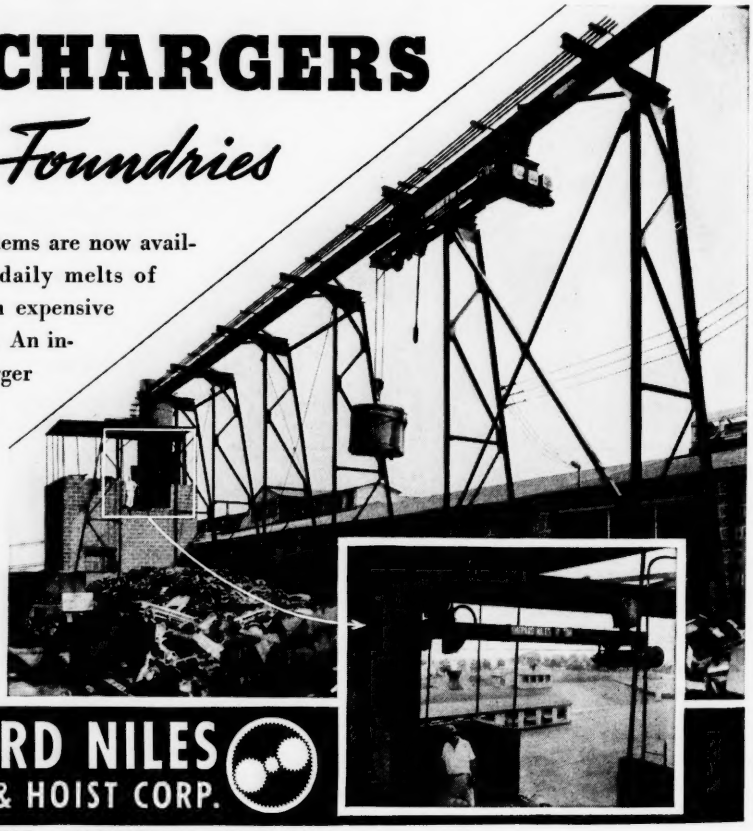
In 1939 there were 77 new industries reported located on the Norfolk and Western Railway, with an investment of over four million dollars and employing 2,576 persons. There were 11 new tributary industries on lines other than the N. & W. with an investment of $805,000 and employing 375 persons. Sixty-six additions were made to established industries on the Norfolk and Western with an investment of $8,367,380 and employing 3,333 persons. There were 34 additions to tributary industries on lines other than the N. & W. with an investment of $5,398,610 and employing 640 persons. Eleven burned plants were rebuilt with an investment of $490,500, employing 228 persons.

The number of industries established during the past nine years were reported as follows: 1931—145 plants; 1932—180; 1933—152; 1934—168; 1935—195; 1936—196; 1937—204; 1938—158; 1939—199, or a total of 1,597 industries and additions. These industries employed 83,574 persons and had a total capitalization of $155,449,322.

With the completion of another year of stable industrial and agricultural growth it is believed that conditions are particularly encouraging for the development of Norfolk and Western territory in the location of new industries and expansion of present industries during 1940.

SLIP-PROOF FLOORING, ETC.— Folder—illustrating and describing a new, revolutionary anti-slip material known as "Ten-Lox," designed for floors, stair treads, walkways, etc.
The National Bronze and Aluminum Foundry Company, East 88th Street and Laisy Avenue, Cleveland, Ohio.

CUPOLA CHARGERS
for Small Foundries



• Mechanical cupola charging systems are now available for small foundries with daily melts of 15 to 30 tons. • No need for an expensive cupola enclosure or charging floor. An inexpensive runway to carry the charger and an operator's platform at the cupola door is all the construction necessary. • Foundrymen who seek better metal at lower costs—no matter what the daily tonnage may be—can obtain complete information by writing to Montour Falls.

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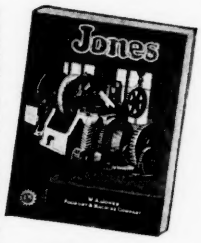

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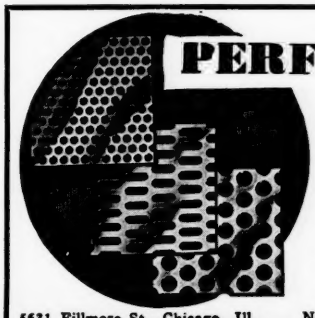

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Manufacturers of Mitco Open Steel Flooring, Mitco Shur-Site Treads and Mitco Armorgrids.

All-Welded Shipbuilding in Mississippi

(Continued from page 29)

means whatever of attachment to either of these structures, it was decided to erect on the inner bottom a substantial structure of shores and rib-bands, carried up to the level of the third deck. Having erected the transverse and longitudinal bulkheads between the inner bottom and third deck, the deck assemblies were next placed in position on the shoring, thus automatically providing a means of attachment for the ground assemblies of side shell plating and framing.

While the inner-bottom plating amidships formed a natural support for the above described system of shoring, difficulties were experienced toward the ends of the ship due to the rapid decrease in width of the inner bottom and the rapidly increasing flare of the side framing. The outboard line of shoring is carried clear of the inner bottom and down to the concrete slab of the slipway itself, thus providing adequate support for the widely overhanging deck. This procedure was followed for the erection of each successive deck.

The shoring and erecting of materials for the extreme ends of the ships required special treatment. The elimination of the third deck at No. 5 cargo hold created an extremely deep hole. A ground assembly of all-flanged plate girders, forming the cargo hatch at the second deck level, were made in a complete assembly and erected as a single unit on the shoring provided for that purpose thus enabling the erection of all framing and beams without difficulty.

In connection with their assembly, it was found helpful to introduce the almost forgotten steel harpin, with which a sort of cradle was formed, thus supporting the upper ends of the frames, and to which the framing was tack-welded in place.

In keeping with accepted practice, the cruiser stern will be made the subject of a ground assembly with all members complete welded prior to its erection.

Exterior staging supports are entirely of steel construction, each upright constructed to form a ladder. These uprights require a minimum of space and reduce very materially the fire hazard. The building of all-welded ships permits the entire system of staging to be considerably simplified, due, of course, to the absence of heavy crafts such as reaming, bolting and riveting.

Single-operator direct-current welding machines are predominantly used and are divided between 400 and 300 ampere units.

The Unionmelt welding equipment used extensively for downhand and welding on decks consists of two machines of 1200-ampere capacity, using the V-type welding head, propelled on a traction carriage mounted on six-foot lengths of track.

A 500-ampere constant potential multiple-operator welding machine has been provided for the use of tack welders in connection with assembly of work on the platens."*

Thus the work continues step by step until, the launching over, the final details are completed in the fitting-out basin before the ship is turned over to the Maritime Commission.

A shipyard where the all-welded process alone is used appears to be a strange place, doing things in a strange way with strange tools, but perhaps nothing is more strange than the absence of litter and noise. Yes, it is possible to go, not only through the 'yard but through the ships themselves, and carry on a normal conversation without interruption.

*"New Ingalls Shipyard" by A. J. Grassick in Marine Engineering & Shipping Review, February, 1940.

ELECTRIC HOISTS—
Bulletin No. 347—illustrating and describing the complete line of the "Load Lifter, Jr." electric hoists.
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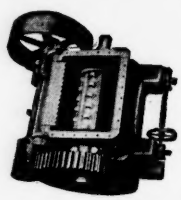
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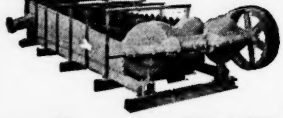
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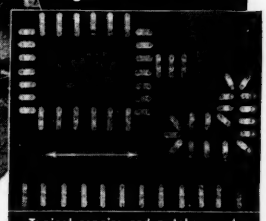

Typical repairs and patches made with Flexco HD Rip Plates.

THOUSANDS of men in industrial plants, mines and mills all over the country are doing just what this man is doing. They are cutting costs by repairing conveyor belts with Flexco HD Rip Plates.

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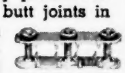

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FLEXCO HD BELT FASTENERS
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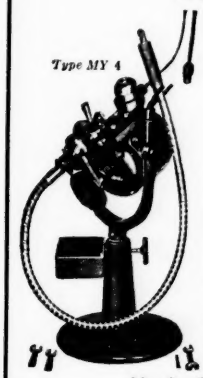

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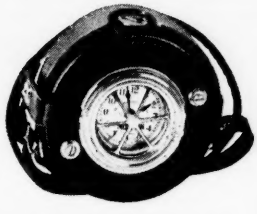

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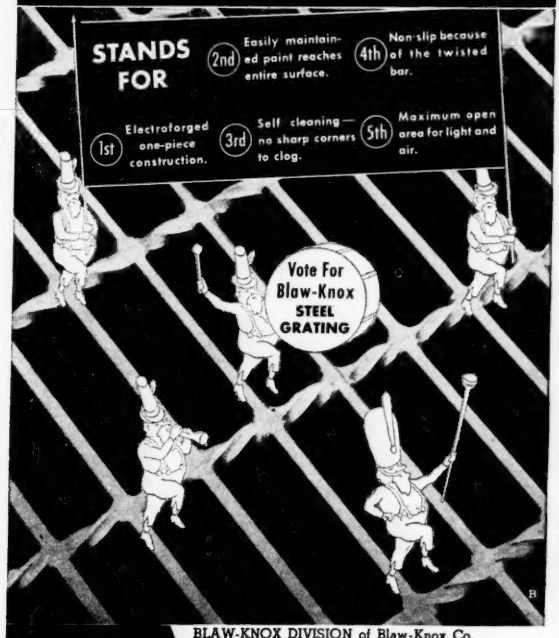
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Industry's Newest Tool

(*Continued from page* 38)

their "cool" light. Actual measurements show that only about one-quarter as much radiant energy (heating effect) per foot-candle is obtained with these new sources as compared with filament lamps. This quality is important to anyone desiring to air-condition since higher levels of illumination (known from researches in seeing, to be needed) can now be attained with little or no change in air conditioning requirements.

The fundamental principles of illumination remain unchanged regardless of the illuminant. Although the bulb shape, size, light diffusion and distribution characteristics of the lamps called for new designs in reflecting equipment, our concepts of practice as regards brightness, reflected glare, contrasts and shadows must be given the same, full consideration when these new sources are applied. Any installation that achieves certain specified *quantities* of light at the sacrifice of comfort is neither economical nor acceptable.

The elongated source suggests extreme accuracy of light control, but for most applications well - designed reflecting equipments are required. Many manufacturers of lighting equipment now have luminaires for general and supplementary fluorescent lighting. The RLM fluorescent unit uses two 48-inch lamps and has been applied to many industrial lighting tasks.

The Illuminating Engineering Society studies of specific seeing problems in industry have shown that in a great many cases the best solution is a source of large area and low brightness. These requirements are met with the 1½-inch lamp in a suitable reflector that directs light down from the entire width of the reflector. Many good commercial units of this type are available.

The Mazda F daylight lamp is the first source to produce light of daylight quality at a high efficiency. Although the energy distribution does not exactly match average daylight, experience has shown that it is suitable for most commercial color work. It has proven very satisfactory for the lighting of hosiery pairing tables when the stockings are accurately matched in pairs. With the lamps mounted in canopy units over the inspection tables, shadows are practically eliminated and the reduction in radiant heat has resulted in more comfortable conditions. These lamps have also been found satisfactory for the examination of dyed woolen fabrics of various colors. A variety of other inspection problems have been solved by utilizing the high levels of comfortable illumination possible with the proper application of Mazda F lamps.

Although the lumens-per-watt efficiency of fluorescent lamps is high (53 lumens per watt for the 48-inch white lamp), most applications will require the use of many of these low-wattage sources to build up illumination levels known to be desirable. Edison invented the incandescent filament lamp to "subdivide" the light of the arc lamp which found technicians unprepared for a single source of that high candlepower. Mazda F lamps went further in this direction, giving higher efficiences and brightnesses lower than of filament lamps now used for general service lighting. To take full advantage of this new source, it should be used to provide the illumination levels known to be needed rather than to meet only minimum standards heretofore published.

1940 Edition of Metal Statistics

Publication of the 33rd annual edition of METAL STATISTICS has been announced by American Metal Market, publishers, 111 John Street, New York City. Already replete with useful information on ferrous and non-ferrous metals and miscellaneous economic subjects, the new issue contains many added features as well as refinements in other ways. Due to the growing importance of scrap materials, in the iron and steel section, statistics are presented on the annual consumption of steel scrap in steel making in the United States, as are also figures on the amount of pig iron used for the same purpose. In the non-ferrous metals group, new tables have been added in the copper section recording the monthly domestic sales by the primary producing interest, monthly receipts of scrap by the custom refiners and a record of price changes on Electrolytic. In the tin section, information is presented on domestic consumption and statistics added to show its use in greater detail than heretofore. The publication is 6 inches by 4 inches, and is priced at $2.00 per copy.

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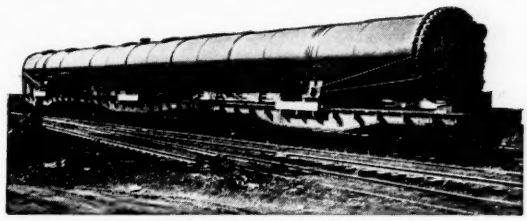

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General Steel Plate Construction designed for your requirements.

Lancaster Iron Works Inc.
Lancaster, Pa.

United States Trade with Scandinavia

(*Continued from page* 31)

invaded by Russia and have not been resumed since. Meanwhile, in the territory ceded to Russia to date (definite terms of the peace treaty are not yet disclosed, if they have been concluded) there are more than a dozen pulp mills with a combined capacity approximating 20 per cent of Finland's output of pulp.

The next largest group of imports from both Sweden and Norway consisted of ores and metals. Imports of iron and steel from Sweden in 1939 increased to 24,039 tons from 15,373 tons in 1938 while imports of the same commodity—principally ferro-manganese, from Norway—rose from 14,615 tons in 1938 to 20,877 tons last year.

Fish and fish oil imports from Norway increased from 36,433,000 pounds in 1938 to 43,004,000 pounds in 1939.

Imports from Denmark normally consist of meats, cheese, grass and forage seeds, other agricultural products, and cement. Imports of cement and of the vegetable products group increased in 1939, but imports of animal products declined.

WIRE ROPE—
Leaflet—describing and illustrating applications of "Flex-Set" Preformed Yellow Strand Special LeTourneau wire rope. **Broderick & Bascom Rope Company,** St. Louis, Mo.

Simplifying Cost Accounting

(*Continued from page* 33)

times a week, and when payments are made on the 10th and 25th of the month, the operator merely totals the amounts shown on the voucher, and writes in the amount on the check.

As she writes the checks on these paying days, all information automatically duplicates to a check register to provide an exact office record of total payments. While, the difference between the total figure shown on the cash receipts journal and the total of the check register sets up a control figure for the cash on hand or in the bank.

When the checks are written, the vouchers are then separated from the check. The original voucher accompanies the check to the vendor, while the other two duplicates remain in the office to provide an alphabetic and numerical crossfile of payments.

"The advantages of our general accounting plan speak for themselves in the efficient, time-saving manner by which *all* our records are maintained on this one Burroughs machine," Mr. Van Wyngaarden commented.

"This machine is to our office what the very latest piece of production equipment is to our lithographing plant. To justify themselves economically both must give good continuous service, be able to handle unseen variations in volume, and perform their tasks so as to assure a profitable operation."

What's the Cause of Anti-American Isms

(*Continued from page* 35)

I would like to ask the leaders and patrons of this new miracle working machine:

What would you do if the national debt had reached the saturation point and not another dollar could be added to it? That day must surely come if we continue much longer with the New Deal.

Tell the people what you would do under those circumstances. They have a right to know.

What you would do then, why not do right now, before the bankrupt notice is nailed on the Treasury?

The tailor should cut the garment according to the cloth or he will soon have no cloth to cut.

You cannot keep on talking about conditions seven years ago. Please talk about conditions as they are today, with nine or ten million men without jobs and with the greatest national debt that any country has ever known in the history of the world—and it must be paid with interest.

Please tell us how!

The economic and political philosophy of today belongs in the insane ward of the penitentiary.

It is both criminal and crazy.

GIGANTIC WEAVING "SHED" COVERED with Carey BUILT-UP ROOFING While Plant Operates at Top Speed

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Capacity 1000 Tons per Month. 3000 Tons in Stock
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The Largest Steel Fabricators in the Carolinas
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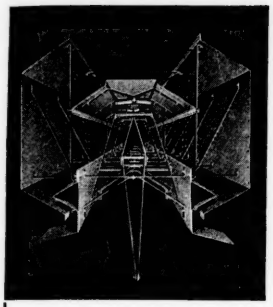

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Roof Ventilators • Oil Filters • Exhaust Heads

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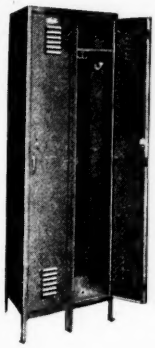
Ideal for Clothing Storage in



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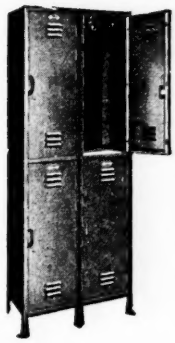

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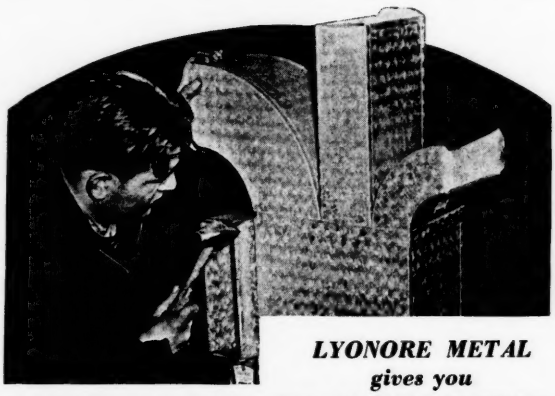

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SPECIFY ORIGINAL SOLID CORRUGATED WIRE GLASS

It *diffuses* light with a minimum of shadows. *It is practically* self-cleaning and can be used on a roof of any material and supply daylight in manufacturing and industrial plants—an important factor in all modern production.

Also used with excellent results on sidewalls, marquises, canopies and wherever daylight is needed.

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The Pulp and Paper Situation

(*Continued from page* 41)

tons of wood pulp and an estimated 800,000 tons of newsprint. Add to the latter United States imports of 2,379,000 tons of wood pulp and 3,317,000 tons of newsprint and we have a grand total of imports for the world's three largest consuming countries of 4,139,000 tons of wood pulp and 4,117,000 tons newsprint with Canada almost the only exporter to rely upon. But if Scandinavian supplies are cut off, Canada's exports will be insufficient by more than 1,200,000 tons of wood pulp and 1,000,000 tons of newsprint to fill the needs of the United States, England and France, to say nothing of other nations' requirements.

This deficit may be reduced to some extent by the action of Allied supply ministries as indicated in the British "Control of Paper" Order No. 11, which states that, effective April 13, the amount of paper and paper board which English paper mills can supply to customers, except under license during the three month period ending June 1, 1940, is 30 percent of the amount supplied during the same period of 1939.

Even so, the possible, or even probable shortage of wood pulp, and possibly newsprint, is apparent for the future. Should England exercise her prerogative of commandeering the Canadian supply, the effect on United States' supplies would be severe. For that reason, if no other, questions are being asked as to the ability of United States mills, and southern mills in particular, to supply the potential shortage.

According to recent estimates the capacity of this country's pulp and paper mills is expanding gradually. In the South, today, are 83 such mills with a combined capacity approaching 15,000 tons per day. However, it must be borne in mind that only one of these mills is producing newsprint and the others produce a vast quantity of miscellaneous products. Several of them produce no pulp whatsoever and others that do make pulp, make it for products totally unrelated to printing paper.

In what way and to what extent the South may expand its pulp and paper production is the problem now being considered.

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The O. Henry, *Greensboro, N. C.*

New Insulation Method

Development of a new method of holding rock wool in position in buildings has been announced by the rock wool department of the Reardon Cement Co., of Cincinnati, Ohio, known as the Reardon Insulating Co. This method involves a new fireproof and quick manner of holding rock wool in position so that it cannot slip downward of its own weight nor fall away because of the decaying or breaking of paper supports as are now used. The Reardon method consists of an adjustable steel tie anchored at intervals inside the wood studs and tightly binding the wool in place. The ties or snaps are effective regardless of the spacing of the studs, whereas with paper ties the studs must be absolutely uniform, it is declared. The ties are sprung into position between the studs without the use of tools or nails, this method permitting a permanent air space between the wool and the plaster on an outside wall to avoid condensation. On inside knee walls, the ties hold the wool tightly against the plaster as long as the building stands.

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A new motion picture being distributed by the United States Steel Corporation depicts the progress of steel from the mining of the ore until the shipment of the finished product.

There are seven sound reels, each complete in itself, in 16 or 35 millimeter sizes, available for distribution by United States Steel offices in Pittsburgh, Chicago, New York, Birmingham, Cleveland and San Francisco.

Technical societies, schools, colleges, civic and business organizations and others may obtain the films free of charge by application to the nearest distributing center.

Pilot Plant For East Texas Iron Ore

(*Continued from page* 48)

tion of Texas are listed as O. H. Grissom, of Longview, president; H. P. McGaughy, of Gilmer, Texas, secretary-treasurer; Mike Harvey, of Tyler, Texas, vice-president; Justin R. Querbes, of Shreveport, La., vice-president; Nat D. Heaton, of Jefferson, Texas, Hohn R. Alford, of Henderson, Texas, and L. N. Crim, of Kilgore, Texas, together with the foregoing officers comprise the board of directors.

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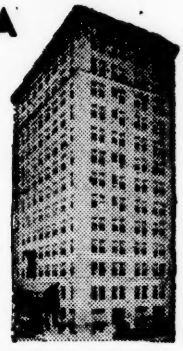

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7x7x6 Ing. Rand FR1 93 CFM 100 lbs.

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12x10	Ch.P. NSB	368 CFM	100 lbs.
12x10	Sullivan WG6	368 CFM	100 lbs.
12x10	Penn. 3A	368 CFM	100 lbs.
12x12	Gardner	385 CFM	100 lbs.
10x10	Sullivan WG6	258 CFM	100 lbs.
10x9	Penn. 3A	240 CFM	100 lbs.
12x8	Chicago NSB	336 CFM	40 lbs.
10x8	Penn. 3A	233 CFM	70 lbs.
9x8	American WP	173 CFM	100 lbs.
9x6	Ing. Rand ER1	153 CFM	40 lbs.
8x6	American WP	120 CFM	60 lbs.
7x6	All Makes	93 CFM	100 lbs.
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